



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**

21 DECEMBER 2007



## Table of Contents

	<u>Page</u>
Section 1. Purpose of the Guidebook .....	3
Section 2. USMC Continuous Process Improvement Strategy .....	4
Section 3. USMC CPI Roles and Responsibilities.....	7
Section 4. USMC CPI Campaign Plan .....	11
Section 5. CPI Goal 1: Conduct Successful CPI Projects.....	12
Section 6. CPI Goal 2: Provide Strong Implementation Infrastructure.....	14
Section 7. CPI Goal 3: Enable CPI Success with Skills Development and Training .....	16
Section 8. CPI Goal 4: Support an Enduring Culture of Continuous Improvement.....	18

### APPENDICES & SUPPORTING PLANS

- APPENDIX A – USMC CPI Implementation Scorecard
- APPENDIX B – Glossary of CPI Terms
- APPENDIX C – CPI Training Plan
- APPENDIX D – CPI Communication Plan
- APPENDIX E – CPI Risk Mitigation Plan
- APPENDIX F – USMC Strategic Planning Model
- APPENDIX G – CPI Project Development Guide
- APPENDIX H – References
- APPENDIX I – CPI Working Group Members

### FIGURES

Figure 1 – USMC High Impact Core Value Streams and Leaders .....	5
Figure 2 – USMC CPI Project Development Process.....	6
Figure 3 – USMC CPI Leadership Roles.....	7
Figure 4 – CPI Project Methodology.....	13



## **Section 1. Purpose of the Guidebook**

The purpose of strategy, goals, and methods contained in this guidebook is to improve the combat readiness and warfighting capability of the Marine Corps – and the quality of life for our Marines, their families, and our civilian-Marines.

**What:** Marines pride themselves on continuous improvement and accomplishing “more with less” – on being lean. Everyone wants to make the Marine Corps better. The guidebook that follows begins to answer the question “how do we do that?” The guidebook establishes standard problem solving methods and concepts that will help Marines and civilian-Marines continuously improve performance and maximize the “bang for the buck” from our resources. Just as we need a deliberate planning process to help us organize to accomplish assigned missions and tasks, we need a standard process to make the Marine Corps better; to move from today’s reality to achieve tomorrow’s vision and goals.

**Who:** The guidebook is intended for use by continuous process improvement (CPI) practitioners: CPI Implementation Champions, the USMC CPI Working Group, CPI project leaders, CPI team members, and CPI experts (LSS Green Belts, Black Belts, and Master Black Belts) across the Corps.

**Why:** Application of CPI methods will help leaders identify and prioritize opportunities and problems and then to apply a disciplined, proven method to incrementally and continuously improve performance. And, the guidebook serves as an interim compass until more formal policy can be established.

**How:** The guidebook is not policy. The ACMC directed that a working group be established to coordinate CPI across the Corps. The USMC CPI Working Group has collaborated in the development of this CPI Guidebook, Version 1. The guidebook is a first step in the journey to institutionalize a consistent, standard, approach to performance improvement. The guidebook itself will evolve; it will be improved and streamlined as we get smarter. Version 2 is scheduled to be published during the fall of 2008. In the meantime, the USMC CPI working group will use the guidebook as a starting point to develop a series of MARADMINS. Those temporary policy documents will be cancelled and integrated into a Marine Corps Order during early FY09.

**The Bottom line:** The purpose and focus of CPI is to improve readiness and warfighting capability. Improving the Corps is not something apart – separate from normal work activity. No, improving the Corps is a part of the daily activity of every Marine and civilian Marine. The Guidebook helps explain “how to” improve the Corps. In the long run, the motivation and methods we apply to make things better must become like DNA, an intrinsic way of thinking, an instinctive approach, without mandate or compulsion, to achieve opportunities and solve problems we all face.

A handwritten signature in black ink that reads 'DR Clifton'.

David R. Clifton  
Director  
Marine Corps Business Enterprise Office



## Section 2. USMC Continuous Process Improvement Strategy

**Purpose of Marine Corps CPI.** The purpose of CPI is to help improve the combat readiness and the warfighting capability of the Marine Corps. This is accomplished by applying a common approach and proven support tools to continuously and incrementally improve processes. When leaders establish goals or create a vision of the future, CPI methods help achieve them. CPI results are typically measured using the following metrics:

- Improved Performance (Process Quality, Reliability, and Security)
- Reduced Process Cycle Times
- Improved Safety
- Improved Workplace Quality of Life
- Improved Affordability
- Improved Flexibility or Ability to Meet Emergent Requirements
- Improved Customer (Warfighter) Satisfaction

“The mission is clear:  
creation of more readiness  
and assets within our budget  
through LSS.”

- SecNav

**CPI is DoD-Wide Mandate.** DoD/DoN CPI policy focuses on improving warfighting capability. The process improvement effort uses Theory of Constraints, Lean, and Six Sigma to improve performance and affordability in all warfighting support organizations. CPI efforts in the Marine Corps align with DoD and DoN policy and translate

that guidance into plans compatible with Marine Corps culture and environment.

“CPI has proven to be an  
important tool for improving  
the operating effectiveness  
of the DoD...”

- Deputy SecDef

**Strategic Alignment of Marine Corps CPI Across the Enterprise.** Conducting enterprise-wide CPI projects aligned with the Commandant’s Guidance is a leading aspect of Marine Corps CPI implementation strategy. Strategy integration links the strategic goals/objectives between the levels and across the processes of an entire organization. Value stream analysis identifies high impact, strategically aligned projects, and project teams work on the highest priority projects.

**Marine Corps CPI Implementation Strategy.** The Marine Corps has adopted a four-part CPI implementation strategy:

- Define and document USMC strategic processes.
- Assign roles and responsibilities for CPI.
- Create organic CPI capability across the Corps.
- Create standard CPI methodologies.

**CPI Connections.** CPI is linked closely with two other process efforts: enterprise architecture and internal controls. Enterprise Architecture is a discipline that provides organizational process design, definition of customer outputs, and information systems that support the processes. Internal controls ensure processes are operating as they should, in large part through the use of written procedures and checklists. Checklists provide two main benefits: (1) they help memory recall, especially in situations where mundane matters are likely to be overlooked but remain critical; and (2) they make explicit the minimum, expected steps in complex processes. The aviation community makes extremely constructive use of procedures and checklists – CPI encourages more widespread use of checklists as outputs of improvement projects in other areas.

**USMC Strategic Processes.** High Impact Core Value Streams are strategic processes that support combat readiness and the warfighter. The Marine Corps Requirements and Oversight Council (MROC) designated nine USMC HICVS. The MROC also designated senior leaders to be responsible for

managing, coordinating, improving, and reporting the overall performance of the HICVS, even though it may cross organizational lines.

The Expeditionary Force Development System (EFDS) constitutes the primary aligning process that is designed to deliver and sustain MAGTF capability. Other processes interact to support that purpose.

Figure 2 lists the USMC HICVS and the MROC designated leader of the process. HICVS are the highest level processes and each can be subdivided into many subordinate level.

<u>USMC HICVS</u>	<u>HICVS LEADERS</u>
CAPABILITY DEVELOPMENT (OR EFDS)	DC, CD&I (w/ CG, TECOM)
TOTAL LIFE CYCLE MANAGEMENT	DC, I&L
ACQUISITION	CG, MCSC
AVIATION MATERIEL LIFE CYCLE MANAGEMENT	DC, AVIATION
HUMAN RESOURCE DEVELOPMENT	DC, M&RA
RESOURCE ALLOCATION	DC, P&R
INSTALLATION MANAGEMENT	DC, I&L
INFORMATION TECHNOLOGY	DIR, C4/CIO
SERVICE ADVOCACY	DC, PP&O

**Figure 1 – USMC High Impact Core Value Streams**

In addition to the HICVS owners, key CPI Stakeholders include:

- Commanders of MarForCom, MarForPac, and MarForRes
- Commanding General, Marine Corps Logistics Command
- Commanding General, Recruiting Command
- Commanding General, Marine Corps Systems Command

The MarFors, Logistics Command, and Recruiting Commands also have key roles in CPI as the link between the major supporting organizations and Marine Corps Operating Forces. The MarFors help communicate the requirements of the Operating Forces to the Supporting Establishment and assist in identifying CPI priorities for enhancing readiness.

Incremental process improvements within HICVS will eventually produce dramatic impacts. HICV owners can and are expected to make strategic improvements by working on the interactions, or seams, between the various process steps – especially those that cross organizational boundaries.

**Marine Corps CPI Project Development Process.** The CPI project development process begins with identification of strategic priorities by top leaders. Process mapping and analysis then identifies high impact project opportunities that directly support the strategic priorities and meet customer requirements. An Improvement Plan is developed to implement the high impact projects and just-in-time training is provided to directly support each project. Metrics are used to monitor, manage, and sustain the process performance gains. Lessons and results are shared via the chain of command to the MROC, CMC, and SecNav. See figure 3 and Appendix G, *USMC CPI Project Development Guide* for detailed information.

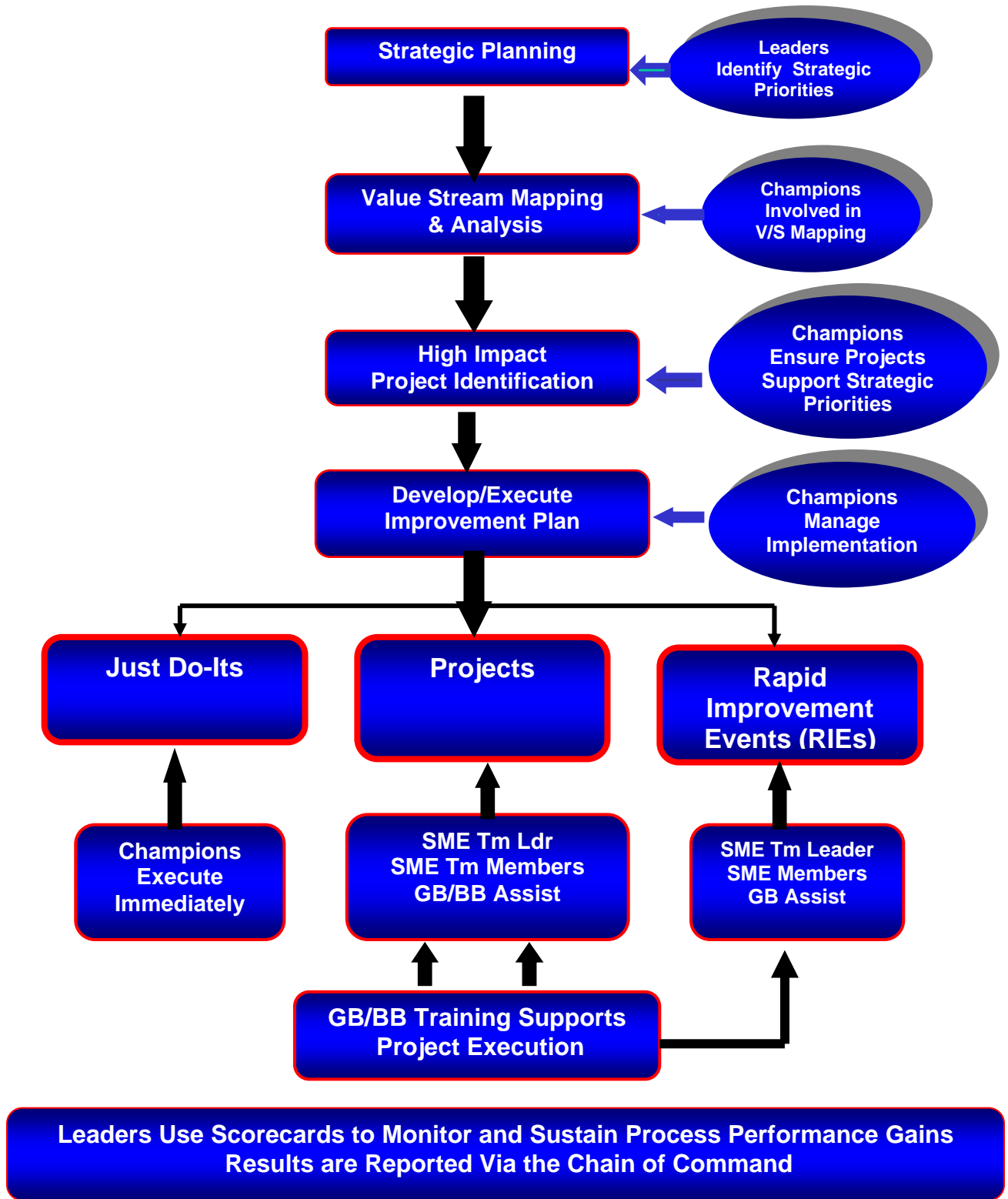
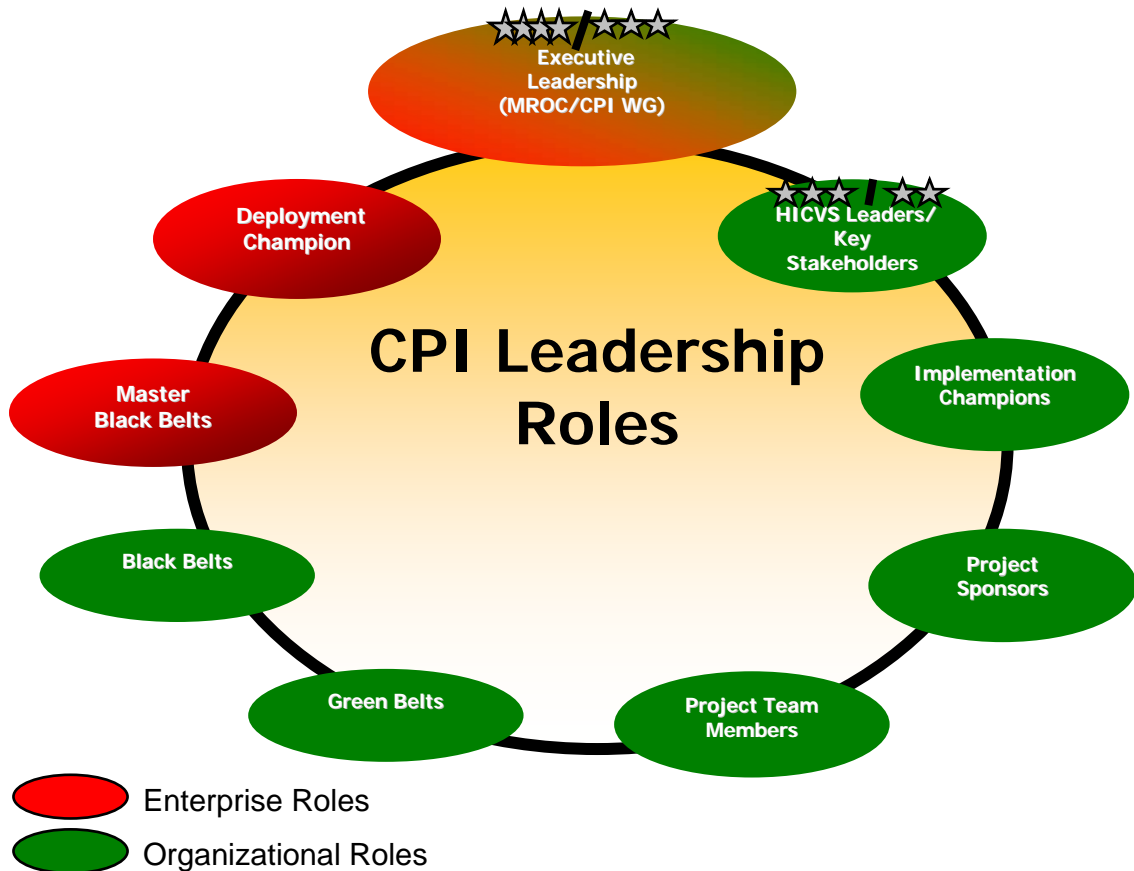


Figure 2 – Project Development Process

### Section 3. USMC CPI Roles and Responsibilities

Successful implementation of CPI depends on effective leadership, a supporting infrastructure, down-to-earth concepts and terminology, and pervasive institutional value placed on continuous improvement. Marine Corps CPI provides implementation support and engages key leaders and commanders in the roles depicted in figure 3. The roles of Champion, Project Sponsor, and Team Member can be performed at any level of the organizational hierarchy in the Marine Corps.



**Figure 3 – USMC CPI Leadership Roles**

**Marine Requirements Oversight Council (MROC).** The Commandant, ACMC, and members of the MROC lead CPI. The MROC provides CPI oversight and policy guidance and establishes priorities for the application of CPI in the Marine Corps. As the executive leaders for USMC CPI, the MROC sets high-level objectives, helps maintain the momentum of implementation, and helps obtain support and endorsement throughout the Marine Corps.

**HICVS Owners and Key CPI Stakeholders.** HICVS leaders and key CPI stakeholders are CPI advocates who accomplish the following:

- Use CPI to improve combat readiness and warfighting capability.
- Conduct analysis of respective processes, identify and prioritize high-impact CPI projects that improve combat readiness/Quality of Life, and apply CPI standard methods to execute projects.
- Designate a colonel/GS-15 (or NSPS equivalent) to serve as the organizational CPI champion and participate in the USMC CPI working group.
- Ensure CPI training is accomplished according to USMC policy.



- Report CPI results to HQMC(LR) NLT last working day of each month to inform MROC and support monthly SecNav briefings by the Director, Marine Corps Staff (DMCS).
- Ensure security is maintained and/or improved during each project.

Organizational leaders at all levels are expected to advocate continuous improvement of performance. All leaders are responsible for managing, improving, and reporting the performance of functions that support warfighting readiness. They champion continuous improvement within their respective organizations and ensure resources are available to conduct improvement projects. They also support cross-organizational or joint process improvement projects that involve other organizations and assign responsibility to an individual to support CPI implementation in their organizations.

**Implementation Champions.** Dedicated positions reporting to HICVS leaders and key CPI stakeholders who are assigned duties to coordinate and support the implementation of organizational CPI efforts within their organization. Their duties are to:

- Assist leaders and Project Sponsors with selection of projects and project participants.
- Support selection, training and assignment of project participants – including Green and Black Belts (all Black Belts and Green Belts should be assigned projects prior to training).
- Maintain organization project portfolio and tracking progress to ensure.
- Assist in case projects become stalled in the DMAIC process.
- Communicate USMC standards and guidelines within the organization.
- Develop supporting implementation plans in support of commander's priorities.
- Share lessons, benefits, and results (including the reporting function).
- Participate in USMC CPI Working Group (HICVS and Key Stakeholder champions only).

**Project Sponsors.** Leaders and managers in all organizations who sponsor projects and:

- Identify and define scope of projects.
- Write charters and identify project team members.
- Manage project execution in tollgate reviews.
- Remove barriers and provide resources.
- Implement process improvements.
- Ensure right people attend meetings.
- Report results.
- Monitor/sustain improved process performance with a scorecard.
- Tie CPI results to individual performance elements.

**Project Team Members.** Project team members are functional subject matter experts (SMEs) in any organization that serve part-time on ad hoc CPI project teams formed to improve processes in their functional area. They may serve on project teams led by Green Belts or Black Belts. As project team members, their value to a project is critical, as they possess intimate knowledge of the process and customer requirements.

**Green Belts (Level 1 CPI Expert).** SMEs in any organization that may serve on project teams led by Black Belts, or they may lead a CPI project team part-time in their area of functional expertise. May be certified. Usually not full-time. Training standards are contained in Appendix C.

**Black Belts (Level 2 CPI Expert).** Certified full-time organizational positions responsible for leading CPI projects with larger scope and impact. Organic to organizations, these CPI experts are knowledgeable and skilled in leading project teams in the use of CPI tools and methodologies. Training Standards are contained in Appendix C.

**Master Black Belt (Level 3 CPI Expert).** Certified, full-time positions responsible for providing training and technical implementation support to Marine Corps organizations. Deployed by DC, I&L and located in the CPI Regional Support Teams. Training standards are contained in Appendix C.



Regional CPI support teams are composed of Level 3 CPI specialists (aka Master Black Belts). Based on their strategic positioning throughout the Corps, CPI support teams will assist supported commanders and HICVS leaders with implementation and execution of a tailored, self-sufficient CPI capability. While DC, I&L retains full authority and financial /NSPS support responsibilities over CPI support teams, their effectiveness is wholly dependent on the use of the supported command's authority. Thus, supported/supporting command relationships must be established based on the unique requirements associated with their strategic positioning and the needs of the supported commander or HICVS leader. Supported MarFor commanders and HICVS leaders will assist DC, I&L to refine the requirements (number, location, size) and support command authority requirements for regional support teams through the USMC CPI Working Group.

Regionally located teams are intended to provide a long term support solution that increases flexibility, reduces travel from a HQMC located team, and reduces overall cost to commanders vice getting SMEs by other means. The mission (or function) of the regional CPI teams is to provide direct support to HICVS owners and key stakeholders according to the following specific duties:

- Provide technical expertise for CPI program development.
- Assist in high level process mapping.
- Assist in project development, prioritization, and execution of projects.
- Train, coach, and certify personnel (leaders, Green Belts, Black Belts) according to CPI standards.
- Facilitate CPI program lessons retrieval, collection, and sharing leading to project replication.
- Assist in removing barriers to improvements.

CPI Team One supports HICVS owners in the National Capital Region. CPI Team Two supports key stakeholders in the eastern region, including: MarForCom, MarForRes, Recruiting Command, and LogCom. CPI Team Three supports key stakeholders in the pacific region including: MarForPac, MarForRes, Recruiting Command, and LogCom. CPI teams are administratively supported, trained, and resourced by DC, I&L (Director MCBE0). Facility and logistic support from key stakeholders within the region is essential for their success.

**USMC CPI Working Group.** The USMC CPI Working Group is composed of O-6/GS-15 level representatives of the HICVS owners and key stakeholders. The working group will:

- Represent each HICV Leader, MarFor Commander, CG's LogCom and MCSC, at the Colonel/GS-15 (or NSPS equivalent level) and key stakeholder.
- Support development of CPI policy and timely results reporting.
- Support effective CPI implementation including issues that cross functional areas, organizations, and HICVS. The CPI working group will focus on replicating the results of successful projects.

**Deputy Commandant, Installations and Logistics.** Per ACMC direction, the DC, I&L will:

- Ensure MROC is informed of CPI progress and assemble monthly CPI reports in support of SecNav updates by ACMC and DMCS.
- Issue appropriate CPI implementing policy and, with support from DC, P&R, provide CPI support programming oversight for implementing organizations.
- Appoint the Director, Marine Corps Business Enterprise Office (MCBE0), to lead the USMC CPI efforts, provide CPI functional oversight, and chair the Marine Corps CPI Working Group.
- Establish regional CPI support teams manned with CPI Black Belts and Master Black Belts.
- Ensure CPI teams possess appropriate expertise and capability.

**CPI Deployment Champion.** Director, MCBE0, as the USMC Implementation Champion, will:

- Chair the CPI Working Group.
- Provide implementation leadership.
- Assist HICVS owners, key stakeholders, and other leaders improve processes.



- Coordinate CPI policy and doctrine development.
- Develop CPI implementation plans.
- Coordinate with DC, P&R to obtain sufficient CPI resources and link CPI with internal controls.
- Assemble CPI progress reports.
- Work closely with the USMC CPI Working Group to provide a standard USMC CPI approach.
- Manages regional CPI support teams in direct support of HICVS owners and key stakeholders.

**Other Key Roles:**

- DC, Aviation coordinates as appropriate with the NavAir Airspeed program and DC, I&L to ensure maximum alignment of process improvement concepts and methodologies.
- DC, P&R coordinates with DC, I&L to resource the CPI program.
- DC, CD&I and CG, TECOM coordinate with DC, I&L to incorporate CPI into training and education programs.
- CG, LogCom accelerates CPI deployment within LogCom, coordinates as appropriate to ensure maximum alignment of process improvement concepts and methodologies within the Marine Corps, and ensures that lessons learned from advance process improvement applications at the depots are widely shared.

**CPI Benefits, Lessons Learned, Metrics and Reporting:**

**Financial Benefits Associated with Marine Corps CPI.** The primary purpose of CPI in the Marine Corps is to improve the combat readiness and warfighting capability of the Marine Corps. CPI will help meet existing financial pressure while maintaining high-quality support to the warfighter. SECNAVINST 5220.13 dated 30 November 2007 codifies tracking results using the CPI program management support (IT) tool. Within the Marine Corps, MROC Decision Memorandum 06-2007 established the policy that generating organizations can retain any cost benefits from CPI projects.

**Sharing CPI Lessons Learned and Results.** An automated CPI project management system is being employed to support reporting of CPI project results required by SecNav, and to support enterprise-wide sharing of information and lessons learned. This effort will facilitate one of the most important qualities of great organizations: replication of success by sharing results and lessons learned. The automated system also helps champions and improvement teams manage project information and documents. It has enterprise document management and a global search capability to support enterprise-wide information sharing. It should minimize, or eliminate, reporting requirements. The primary purposes of the automated reporting system are to:

- Support management of local project documents and information.
- Share lessons learned to accelerate continuous project improvement across the Marine Corps.
- Share good ideas so that good results can be replicated.
- Validate the utility of CPI by reporting results and benefits.
- Validate good stewardship of current resources provided to the Marine Corps.

**CPI Metrics and Reporting.** CPI metrics are reported monthly by Implementation Champions (or CPI working group members) and are maintained by the Chair of the USMC CPI Working Group in support of monthly briefings by the Director of the Marine Corps Staff to SecNav. Initially, this information will be collected in monthly reports. Ultimately, all CPI reporting will be included in the DoN standard automated project management tool and will not require additional reporting by field organizations.

Metrics will be maintained in the automated CPI project management system (CPIMS). This monitors the key performance metrics of the HICVSs and processes that support Marine Corps warfighting capability.



## Section 4. CPI Campaign Plan

### Mission

The CPI mission is to improve USMC combat readiness, warfighting capability, and the quality of life for our Marines, their families, and our civilian-Marines. CPI contributes to MAGTF capability and readiness through continuous improvement of all support processes using process improvement tools to reduce cycle times, optimize process reliability, and improve affordability.

**The CPI mission is to improve the combat readiness and warfighting capability of the United States Marine Corps.**

### Vision

MAGTF capability is enhanced by processes that are continuously improved in a fully integrated manner across the Total Force. A disciplined and consistent approach to pursuing opportunities and solving problems is an integral part of leadership. Continuous, incremental process improvement is intrinsic to the way work gets done, opportunities are pursued, and problems solved. Improving the Corps is not a separate, transient program led by external specialists with agendas and terminologies that are unclear to the average Marine. The continuous improvement discipline is part of our DNA.

**Primary Themes in USMC CPI.** There are two overarching themes in Marine Corps CPI that are consistent with the values of the Marine Corps and are reflective of SecDef and SecNav guidance:

- **Improve Combat Readiness and warfighting capability** – The fundamental purpose of USMC CPI is to improve the combat readiness and warfighting capability of the Marine Corps. We are also focused on improving the quality of life for the Marine, families of Marines, and the civilian-Marine workforce.
- **Make big leaps through small steps** – Improved combat readiness and improved warfighting capability is achieved by incrementally and continuously improving processes through application of standard tools to reduce cycle times, provide optimum reliability, and ensure affordability. Many small, local improvement efforts are aligned across the Corps by HICVS owner and key stakeholder's guidance.

**CPI Goals.** The four goals of Marine Corps CPI are:

1. **Conduct Successful CPI Projects**
2. **Establish Strong Implementation Infrastructure**
3. **Enable CPI Success with Skills Development and Training**
4. **Support an Enduring Culture of Continuous Improvement**

The following sections of the Guidebook provide detailed information about each CPI goal including the specific actions and initiatives required to accomplish each goal.



## Section 5. CPI GOAL 1: Conduct Successful CPI Projects

**Description.** This goal addresses the leadership support required to create a foundation for action and the use of standard approaches for project identification and project implementation to support successful CPI project that improve support of readiness and bring value to the customer through reduced cycle times, improved process reliability, improved safety, improved work life, and improved affordability.

CPI projects are defined as application of CPI tools to specific efforts to improve processes and resolve problems. USMC CPI projects follow a standard approach as appropriate for the problem at hand. Projects can be several types: analysis of HICVS and subordinate processes, process design efforts, and improvement or problem solving projects.

**Successful Projects.** Successful projects should:

- Delight the customer by accomplishing the goals of the project charter.
- Increase MAGTF capability, improve safety, or improve quality of life.
- Train organizational personnel in CPI skills, while solving organizational problems.
- Advance a USMC culture of improvement.
- Produce control procedures or checklists to ensure improvements last.

**CPI Project Identification.** A standard approach is used to identify and prioritize projects (see figure 2). That process focuses projects on improving combat readiness and quality of life; it engages leaders to identify strategic priorities and drive the effort; it identifies and prioritizes strategically aligned projects; and, it ensures quantifiable improvements – or real results – are achieved. All CPI projects should:

- Improve the processes that support combat readiness, warfighting capability, or quality of life.
- Address strategic priorities with project importance being clear to everyone in the organization.
- Address support priorities identified by the customer (warfighter).
- Have the full support of key leaders and commanders prior to project commencement, including a commitment to implement/sustain the gains.
- Target processes with significant potential for improved performance and/or affordability.

Leaders and managers should screen and prioritize proposed CPI projects to ensure they meet project criteria and customer priorities. See *Appendix G - CPI Project Development Guide*, for additional information on the standard USMC CPI Project Development Process.

**CPI and Internal Controls.** The purpose of internal controls is to ensure the USMC processes are managed in such a way as to prevent fraud, waste, and abuse. CPI projects are primary means for leaders to ensure processes are well managed and assist internal control efforts by producing standard procedures and checklists. DMAIC is ideal for this purpose and meets the standard “What gets checked, gets done!”

**CPI Project Implementation.** USMC CPI utilizes a standardized discipline, called the DMAIC project methodology (figure 4), to support the conduct of successful process improvement projects. DMAIC is a deliberate discipline that can be applied to varying degrees of rigor according to the scope of the project. Mastery of deliberate DMAIC skills creates an ability to conduct rapid DMAIC, as rapid planning depends on strong skills in deliberate planning. And, like OODA<sup>1</sup>, DMAIC is cyclic or iterative. Improvement is endless.

---

<sup>1</sup> Decision cycle known as the Boyd cycle or OODA loop. An important concept in both business and military strategy. According to Air Force Colonel John Boyd, decision making occurs in a cycle of observe-orient-decide-act. An entity that can process this cycle quickly, observing and reacting to unfolding events more rapidly than an opponent, can thereby “get inside” the opponent’s decision cycle and gain an advantage.

## Standard Improvement Methodology: DMAIC



Figure 4 – CPI Project Methodology

**Desired Future Outcome.** CPI enhances support to the warfighters with processes that are continuously improved with highly successful process improvement projects. This provides highly effective support to the combat readiness, warfighting capability, and quality of life of the Marine Corps at an affordable cost. The capability to effectively use process improvement tools and methods in an integrated and standard manner is common in all organizations and is supported by HQMC with high quality, cost effective training, and technical support. Continuous improvement is an established part of the leadership and work practices of every organization and is viewed as a routine part of every job.

### Implementation Strategies.

- Use a structured CPI project identification/prioritization process involving strategic planning and value stream analysis in the High Impact Core Value Streams and underlying value streams/ core processes that are key to warfighting capability.
- Apply project selection criteria that ensure all CPI projects target warfighting support, produce a tangible and quantifiable benefit, address customer priorities, and maximize the likelihood of success.
- Ensure each project that is initiated is properly resourced and has commitment from key leaders to fully support each project and to implement and sustain the gains.
- Use detailed project charters and the standard DMAIC project management approach.
- Utilize CPI Support Teams composed of CPI experts (Master Black Belts) to provide CPI implementation and project support to all organizations.
- Provide just-in-time training to Project Sponsors and Project Teams to develop organic CPI capability in every organization.
- Continuously monitor, measure, and sustain the results of each project.
- Replicate success through shared lessons.
- Ensure security is maintained and/or improved during each project.



## **Section 6. CPI GOAL 2: Provide Strong Implementation Infrastructure**

**Description.** This goal supports CPI implementation and project management with appropriate governance, policy, organizational constructs, and a full compliment of the tools required to implement CPI and conduct process improvement projects.

**Governance and Policy.** The ACMC and the MROC lead CPI within the Marine Corps. They have designated the USMC CPI Working Group to coordinate CPI implementation.

The USMC CPI working group meets monthly to accomplish the following goals:

- Coordinate appropriate CPI policy.
- Coordinate the deployment of CPI tools.
- Enable the successful completion of CPI projects.
- Share lessons and replicate CPI improvements as appropriate.
- Establish and achieve CPI training goals.

CPI policy will be developed in a progressive manner. This guidebook serves as an interim reference point for the working group and practitioners. From it, a series of temporary MARADMINS will be developed and published. Finally, the MARADMINS will be cancelled and the policy integrated into a single CPI Marine Corps Order during early FY09.

It will be important for CPI policy to be published in such a way as to fully illuminate the connections between CPI and other important programs such as Business Transformation, development of Enterprise Architecture, and Internal Management Controls.

**CPI Organizational Construct.** To succeed, the CPI implementation must be supported by a strong infrastructure. The roles and responsibilities associated with this infrastructure are contained in section 3.

The CPI organizational construct has two tiers: enterprise level and organizational level.

The enterprise structure includes the MROC, the USMC CPI Working Group, the Deployment Champion, and the Regional CPI teams. The deployment champion, his staff, and the regional CPI teams (or Master Black Belts) are full time.

The organizational structure includes HICVS leaders, key stakeholders, implementation champions, project sponsors, project team members, Black Belts, and Green Belts. Black Belts are primarily full time. Other positions are part time. Some organizations may have their own Master Black Belts.

**Personnel Development.** A training and personnel development program is required for key roles such as Master Black Belts, Black Belts, and Green Belts. This program includes individual certifications. Details of training and certification are contained in Appendix C.

Assignment of individuals to become CPI Black Belts should be a carefully managed process, resulting in individuals with the greatest potential for future leadership. A minimum 1-2 year assignment as a Black Belt will provide significant development for individuals, helping them understand the key skills of leading organizational change, managing resources, team building, achieving progress through influence without hierarchical control, and fanatical devotion to improving customer support. Ideally, personnel assigned to full time black belt positions will be linked to leadership development programs.

**CPI Information Management Tools.** CPI information management tools will be made available for Master Black Belts, Black Belts, and Green Belts. These tools will be designed to assist in project management, sharing lessons and replicating projects, reporting results to the MROC, supporting process



mapping, and enabling the statistical controls associated with DMAIC. The project support software toolkit is envisioned to include tools that will provide the following capabilities:

- A Black Belt Handbook with standard CPI Project methodology and tools/techniques for each phase of a CPI project.
- Process Simulation/Flowcharting.
- Project Management.
- Activity-Based Costing.
- Statistical Analysis.
- Survey Tools.
- Standard templates for most commonly-used analysis tools.
- Balanced Scorecard.

**Desired Future Outcome.** A full complement of highly effective CPI policies, well developed infrastructure at both the enterprise and organizational levels, and project support tools that our practitioners are well trained to use.

**Implementation Strategies.**

- Publish a series of interim policy CPI MARADMINS during FY08 through the USMC CPI Working Group.
- Publish definitive CPI Marine Corps Order during early FY09 through the USMC CPI Working Group.
- Ensure strong linkage in policy between CPI, Enterprise Architecture, Business Transformation Program, and Internal Controls.
- Create strong infrastructure at the enterprise and organizational level. Master Black Belts and Black Belts will be the full time catalysts to make CPI go forward.
- Refine roles of CPI teams and local Business Performance Offices through the USMC CPI Working Group.
- Develop organizational level, in house, CPI capability – primarily measured through Green Belt, Black Belt, and project density.
- Develop appropriate training goals and certification programs through the USMC CPI Working Group.
- Link Green Belt and Black Belt training to civilian leadership programs, military MOS training, and education.
- Deploy CPI on-line Black Belt Handbook.
- Deploy CPI project support software toolkit.



## Section 7. CPI GOAL 3: Enable CPI Success with Skills Development and Training

**Description.** USMC CPI training supports training in best practices and tools such as Strategic Planning, Lean, Six Sigma, Activity-Based Cost Management, Theory of Constraints, Balanced Resource Management, Integrated Performance Management, Balanced Scorecard, Extended Enterprise Management, and others. These proven CPI tools have been used to improve capability and affordability in industry as well as the DoD and DoN and can be implemented in a consistent manner throughout the Marine Corps.

**Action Learning Approach.** Action learning means we train with purpose and expect results. CPI training is fully integrated with improvement projects. Training ranges from familiarization or introductory training while individuals leading process improvement projects, as a job duty will receive advanced-level training and certification. Most CPI training will be provided to functional-level project team members during the actual conduct of process improvement projects. This “action-learning” approach will resemble flight training where basic knowledge is obtained in ground school, and practical application is achieved under the guidance of a pilot instructor. The regional CPI teams are intended to provide the “pilot instructors” for training and project coaching. Further, this approach ensures that training is clearly linked a near term tangible improvement in performance.

Marine Corps CPI training builds awareness of CPI and prepares varying levels of USMC CPI practitioners to apply a wide range of process improvement tools. It also establishes criteria for USMC CPI certification as Green Belt (Level 1 CPI Expert), Black Belt (Level 2 CPI Expert) and Master Black Belt (Level 3 CPI Expert). CPI skill certification requires demonstrated application of an array of business management tools, including, but not limited to:

- Strategic Planning
- Integrated Performance Management
- Activity Based Cost Management
- Balanced Resource Management
- Systems Thinking
- Balanced Scorecard
- Extended Enterprise Analysis
- Process Improvement Tools including Theory of Constraints, Lean, Six Sigma
- Capacity Management
- Target Cost Management
- Critical Thinking
- Project Management

Certification is part of the process for two reasons: it enhances the organizational integrity of CPI through a common body of knowledge and enhances the credentials of individuals receiving certification. Similar to flight training, certification at any level requires both training and demonstrated experience and successful completion of one or more CPI projects. For example, USMC CPI Black Belts must complete training and pass a certification exam from their training provider, complete high impact projects, and may take the American Society of Quality (ASQ) Black Belt exam, or equivalent. (See *Appendix C - CPI Training Plan* for additional detail.) Periodic recertification is required.

Initially, all levels of CPI training will be provided through expert, external training providers. Over time, the USMC will acquire or develop CPI Experts on the Regional CPI teams who will provide training, coaching and mentoring to CPI practitioners, with the goal of having USMC CPI Black Belts and Master Black Belts participate in all levels of training and certification. All USMC CPI trainers are expected to possess a personal portfolio of CPI success and be expert practitioners first – and first class instructors second.



**Desired Future Outcome.** The Marine Corps workforce is fully supportive of and engaged in continuous process improvement. All employees share the common core value of support to the warfighter, and the



use of CPI methods to improve efficiency and effectiveness are part of the daily routine. All CPI practitioners are fully trained and proficient in the integrated use of CPI tools and methods. CPI practitioners are trained in order to apply skills to specific opportunities to improvement or problems to be solved, in accordance with leadership priorities. CPI practitioners are provided sufficient coaching on projects to optimize success rates. CPI Support Teams are fully trained in all CPI skills and competencies, and are the preferred source for advanced CPI knowledge, current information on tools and techniques, complex problem solving, and expert project support within the Marine Corps, and are highly recognized CPI experts throughout the DoD and industry. Marine Corps CPI training is standardized and highly effective in the classroom, where students are fully engaged; as well as in the field, where action learning supports CPI projects that continually enhance support to warfighting capability.

### **Implementation Strategies.**

- Identify and/or provide training that promotes understanding of CPI concepts and application of basic CPI tools to personnel at all levels of the USMC.
- Incorporate introductory training into training schools (Officer, Enlisted & Civilian).
- Prepare CPI practitioners to successfully lead or participate on CPI project teams using a standard, integrated set of CPI tools and techniques that can be applied flexibly according to the situation.
- Integrate training with projects, and provide sufficient expert coaching to ensure success of organizational CPI Green Belts and Black Belts.
- Establish certification standards and process for multiple levels of CPI skills encompassing an integrated set of business management tools.
- Prepare regional, in-house CPI teams to teach, coach and mentor USMC Black Belts. Prepare USMC Black Belts to teach, coach and mentor USMC Green Belts. Regional CPI teams (or Master Black Belts) will assist in managing project portfolios and development of organizational improvement capability.



## Section 8. CPI GOAL 4: Support an Enduring Culture of Continuous Improvement

**Description.** This goal area addresses the leadership and communication requirements to support continuous process improvement in the culture of the Marine Corps.

**Change Leadership.** Adaptability, a focus on the warfighting mission, and an action orientation to leadership are inherent components of the culture of the Marine Corps and are supported by CPI. The primary purpose of CPI in the Marine Corps is to better support the warfighter and every organization that provides support to the warfighting capability of the Marine Corps is continuously working to improve that support.

Leading the change process is an integral element of successfully implementing CPI and supporting a culture of continuous improvement

A major aim of CPI is to create a process-centric organization with the concept of continuous process improvement imbedded as a key aspect of the organizational and management culture. The following keys to systematic change management from the DoD CPI Guidebook are integrated into the USMC CPI implementation strategy:

- 1. Educate leaders.** Educate key organization leaders on the concepts of CPI, the roles and responsibilities of leaders in CPI, the actions and decisions critical to successful change, and why the change is important.
- 2. Challenge presumptions.** Challenge the status quo, empirically demonstrate the competitive benefits of change, and answer the “What can I do for the Marine Corps?” question with a compelling rationale.
- 3. Secure agreement.** Secure the agreement of key leaders on the need for change and the course of action to begin implementing the change.
- 4. Prepare leaders to lead the change.** Educate and train top leaders in the new standards for success and create the mechanisms (performance metrics and scorecards) for setting the new expectations and generating results.
- 5. Prepare managers to manage the change.** Educate and train managers and supervisors to manage the transition to new ways of supporting the warfighter and to assume new roles.
- 6. Educate everyone in the organization.** Educate and train everyone in the new standards and expectations. This can be accomplished by linking organizational performance goals to the individual job standards of all personnel. This is critical for a successful change to the new level of performance.
- 7. Use a consistent and structured approach for project identification and execution.** The USMC CPI Project Development Process and DMAIC will be used to support successful projects.
- 8. Measure Performance.** It is not possible to improve what is not measured. Marine Corps CPI uses scorecards to monitor the key performance indicators of processes that support Marine Corps warfighting capability and to sustain process performance gains into the future.

**CPI Communication Plan.** The CPI Communication Plan outlines the approach for effectively communicating information related to CPI efforts and will foster collaborative interactions among leaders, stakeholders, and CPI practitioners at all levels. (See *Appendix D, CPI Communication Plan*.)

**A Culture of Continuous Improvement and Community of CPI Practitioners.** Several core values comprise an effective CPI culture. The following core values have been adopted for Marine Corps CPI:

- Focus on supporting the warfighter.
- Teamwork throughout the extended enterprise.
- Be receptive to evolving CPI concepts and tools.

The community of CPI practitioners will encompass all individuals engaged in CPI work who share common core values and embody the culture of continuous improvement.



As more personnel are trained and engage in CPI projects, a community of CPI practitioners will evolve to encompass all individuals engaged in CPI work who share common core values and embody the culture of continuous improvement. While CPI in the Marine Corps will be implemented in established organizational structures, the community of CPI practitioners will also evolve as a functional working body dedicated to performance excellence throughout the USMC. This ever-expanding community of CPI practitioners will form the critical mass of the growing culture of continuous improvement.

**Use Existing Human Resource Management Tools to Support CPI.** The effective use of existing human resources management tools can support the culture of continuous improvement. Civilian employees participating in efforts to improve support to the warfighter should be rewarded using the DoN Civilian integrated with training and rotational assignments of CPI Black Belts – who individuals we are making expert at leading change. Military personnel can be rewarded via fitness reports and individual awards. The National Security Personnel System (NSPS) contains performance-based provisions that can be used to align individual performance requirements of managers and employees to process improvement efforts. Every civilian manager and employee should have a critical performance element for CPI as part of his or her annual performance plan and these can be linked to a scorecard with operational performance targets for their respective organizations.

**Mitigating Risk and Resistance to Change.** Creating change within established organizations and cultures is a significant undertaking. Add the essential requirement for cross-organizational cooperation in process improvement projects that span and cause change in several organizations, and the challenge is compounded. This Guidebook includes a Risk Mitigation Plan in Appendix E to address this issue.

**Measuring the Cultural Acceptance of Continuous Improvement.** Two methods will be used to measure cultural acceptance of continuous improvement:

- The number of in-process CPI projects and requests for project support/training will be monitored.
- The % of GS-15/O-6 and above that are active Champions/Project Sponsors. (Measured by signatures on the charters of successful CPI projects.)
- Density of Green and Black Belts trained within an organization and multiples of projects completed by each.

**Desired Outcome.** The concept of continuous improvement is an integral part of the culture of the Marine Corps and is viewed as a routine part of every job. All leaders and members of organizations continually apply CPI tools and methods to improve the performance and affordability of all support processes. This helps to ensure the combat readiness and capability of the MAGTF.

#### **Implementation Strategies.**

- Develop a CPI communication strategy and communication plan.
- Establish a forum for regular communication with potential project sponsors.
- Track the number of requests for CPI project support or training.
- Correlate all project activity and publicity to support of the warfighter.
- Promote success stories with quantified details in multiple venues, including newsletters, the CPI portal home page, at executive briefings and meetings, and in CPI training classes.
- Provide public recognition of the leaders, managers, project sponsors, and project teams that have supported successful projects, including testimonials from the participants.
- Make CPI a critical performance element for civilian and military leaders and managers.
- Use established military/civilian personnel awards and recognition programs to reward participation in successful CPI projects.



## **APPENDICES & SUPPORTING PLANS**

**APPENDIX A – USMC CPI Implementation Scorecard**

**APPENDIX B – Glossary of CPI Terms**

**APPENDIX C – CPI Training Plan**

**APPENDIX D – CPI Communication Plan**

**APPENDIX E – CPI Risk Mitigation Plan**

**APPENDIX F – USMC Strategic Planning Model**

**APPENDIX G – CPI Project Development Guide**

**APPENDIX H – References**

**APPENDIX I – CPI Working Group Members**



**UNITED STATES MARINE CORPS  
CONTINUOUS PROCESS IMPROVEMENT  
GUIDEBOOK  
APPENDIX A  
CPI IMPLEMENTATION SCORECARD**

**DECEMBER 2007**



Marine Corps CPI Program Plan Scorecard

Goal	Obj #	Objective	Meas. #	Measure	Target				Initiatives
					FY 08	FY 09	FY 10	FY11	
Conduct Successful CPI Projects	CPI 1.1	Conduct Successful CPI Projects	CPI 1.1. M1	● # Projects Completed (Cumulative)	N/A	N/A	N/A	N/A	● CPIMS ● Risk Mitigation Plan
			CPI 1.1. M2	● # Projects Cancelled	N/A	N/A	N/A	N/A	
			CPI 1.1. M3	● # BBs Assigned to Projects	N/A	N/A	N/A	N/A	
			CPI 1.1. M4	● % BBs Completed a Project	100%	100%	100%	100%	
			CPI 1.1. M5	● # GBs Assigned to Projects	N/A	N/A	N/A	N/A	
			CPI 1.1. M6	● % GBs Assigned to Projects	100%	100%	100%	100%	
			CPI 1.1. M7	● # GBs Completed a Project	N/A	N/A	N/A	N/A	
			CPI 1.1. M8	● % GBs Completed a Project	100%	100%	100%	100%	
	CPI 1.2	Improvements in Key Support Processes	CPI 1.2. M1	● # Core Value Streams Mapped	100%	100%	100%	100%	● MCBE Value Stream Analysis ● Benefits Retained by Generating Organizations
			CPI 1.2. M2	● # Marine Billets Realigned	TBD	TBD	TBD	TBD	
CPI 1.2. M3	● \$ Type 1-2 Benefits Achieved	TBD	TBD	TBD	TBD				
CPI 1.3	Sustain Project Results	CPI 1.3. M1	● % Projects Monitored in CPIMS	100%	100%	100%	100%	● Deploy and populate CPIMS	
Provide Skills and Training	CPI 2.1	Provide Understanding of CPI Tools &	CPI 2.1 .M1	● # Rec'd CPI Training in Formal Schools	TBD	TBD	TBD	TBD	● Incorporate CPI in all Training Schools
	CPI 2.2	Provide Skills to Successfully Apply CPI Tools	CPI 2.2. M1	● # Sr. Leaders Trained	N/A	N/A	N/A	N/A	● Sr. Ldr Trng (GS-15/O-6 Above) ● Sr. Ldr Trng (GS-15/O-6 Above) ● Sr. Ldr Trng ● Sr. Ldr Trng ● Sr. Ldr Trng ● Sr. Ldr Trng
			CPI 2.2. M2	● % Sr. Leaders Trained	75%	100%	100%	100%	
			CPI 2.2. M3	● # GOs/SES' Trained	N/A	N/A	N/A	N/A	
			CPI 2.2. M4	● % GOs/SES' Trained	100%	100%	100%	100%	
			CPI 2.2. M5	● # CMC Direct Reports Trained	48	48	48	48	
			CPI 2.2. M6	● % CMC Direct Reports Trained	100%	100%	100%	100%	
			CPI 2.2. M7	● # BBs Trained (Cumulative)	N/A	N/A	N/A	N/A	
			CPI 2.2. M8	● # BBs Certified	N/A	N/A	N/A	N/A	
	CPI 2.2. M9	● # GBs Trained	225	TBD	TBD	TBD			
CPI 2.3	Build Internal Teaching Capability	CPI 2.3. M1	● % Training co-taught by USMC Personnel	N/A	25%	50%	75%	● USMC Belt Certification Program	

Precise training and project goals will be developed by CPI Working Group and published in FY08 MARADMIN.



## CPI ORGANIZATIONAL COMMON OPERATING PRACTICE (COP)

This Excel Chart represents the Common Operating Dashboard for tracking CPI progress for each of the HICVS and key stakeholder organizations. This is the information that must be collected monthly to support required reporting to SecNav. More importantly, these key pieces of information illustrate the progress and density of CPI penetration into each organization. (The data contained in the spreadsheet is for HQMC and is included to demonstrate what the chart should look like for each HICVS and key stakeholder organization.)

Command:	June		JUL		AUG		SEP	
	# of People	% of Goal	# of People	% of Goal	# of People	% of Goal	# of People	% of Goal
<b>CHAMPION TRAINING (Goal is 100%)</b>								
Principal Direct Reports and Deputies (Total # Trained / % of Goal)	45	92%	45	92%	45	92%	45	92%
SES/Flag and General Officers (less above) (Total # Trained / % of Goal)	12	100%	12	100%	12	100%	12	100%
O-6 / GS-15 (Total # Trained / % of Goal)	388	74%	388	74%	402	76%	408	78%
<b>GREEN BELTS (Goal=5%)</b>	300		300		300		300	
Trained -Total # Green Belts Trained ( # / % of Goal)	148	49%	170	57%	170	57%	170	57%
Ready For Tasking -Total # Green Belts Active ( # / as a % of Green Belts Available)	148	100%	170	100%	170	100%	166	98%
Utilized - Total # Green Belts Assigned to Projects ( # / as a % Green Belts Active)	53	36%	49	29%	49	29%	56	34%
<b>BLACK BELTS (Goal=1%)</b>	50		50		50		50	
Trained - Total # Black Belts Trained ( # / % of Goal)	35	70%	35	70%	35	70%	35	70%
Ready For Tasking - Total # Black Belts Active ( # / as a % of Black Belts Available)	35	100%	35	100%	35	100%	35	100%
Utilized - Total # Black Belts Assigned to Projects ( # / as a % Black Belts Active)	74	211%	86	246%	86	246%	91	260%
<b>PROJECTS</b>								
Total # of Projects (Work in Progress)	49		53		54		61	
Total # of Projects Completed (since inception date of 1 Jan 06)	98		103		108		108	



*United States Marine Corps  
Continuous Process  
Improvement Guidebook*

**APPENDIX B  
Glossary of Terms**

December 21, 2007



**UNITED STATES MARINE CORPS  
CONTINUOUS PROCESS IMPROVEMENT  
GUIDEBOOK  
APPENDIX B  
GLOSSARY OF TERMS**

**DECEMBER 2007**



## Glossary of Marine Corps CPI Terms and Definitions

The terminology provided in this appendix has been derived from the *DoD CPI Guidebook* and a variety of continuous process improvement-related publications and programs. Not all of the terms defined here are found in this Guidebook, but are provided as background information.

**Action Learning.** The Marine Corps CPI Program includes a multi-level skill development component that provides training in process improvement concepts/tools and supports practical application. Some training will be brief familiarization or introductory training. However, much of the training will be provided to functional level project team members during the actual conduct of process improvement projects. This “action-learning” approach ensures that training provides a tangible improvement in operational performance that offsets the training investment.

**Action Plan.** A time-phased schedule for executing CPI Events, Projects, and “Do-Its” that transitions a process from the current state to the desired future state.

**Activity-Based Cost Management (ABC/M).** One of the nine USMC core business skills. ABC/M is a cost management system that assigns cost to activities, services, and products and provides critical resource allocation information in a manner not possible with standard Government accounting systems. In Marine Corps CPI, ABC is used in concert with process improvement tools like Lean Six Sigma to effectively manage the balance of cost and performance in processes that support the warfighter.

**AirSpeed.** A continuous process improvement program in the Navy and Marine Corps Aviation communities that employs Lean Six Sigma and Theory of Constraints to improve aviation logistics support.

**Alignment.** The disciplined agreement in an organization between top level strategic plans, goals, and objectives with all subordinate level plans, goals, and actions.

**Andon.** A system of flashing lights used to indicate production status and alerting team members to emerging problems in one or more work centers.

**AVCOM.** Avionics Components Obsolescence Management, a software tool that helps provide forecast and other information on electronic parts obsolescence

**AWP. Awaiting Parts.** A special status for an item held up in a repair process while it waits for parts needed to complete the repair. In DoD, this time is generally not considered in determining the time a repair organization actually spends repairing something.

**Balanced Resource Management.** One of the nine USMC core business skills. There are three categories of resources available to any organization: financial capital, physical assets, and intellectual capital; or simply - money, things and people. The key elements of balanced resource management are accurately identifying and articulating budget and manpower requirements; effective budget execution and alignment of resources to strategic priorities; and process improvement (since waste can consume up to 75% of the typical business process).

**Balanced Scorecard.** A strategic management tool used to drive implementation of the Strategic Plan as well as performance and accountability throughout an organization. The Balanced Scorecard uses four key dimensions to translate strategy into operational terms. These four dimensions are the fundamental cause and effect factors in strategic management:

- Customers
- Operational (process) Excellence
- Financial
- Workforce Growth and Learning



**Baseline Measure.** A statistic or numerical value for the current performance level of a process or function. A baseline measure needs to be taken before improvement activities are begun to accurately reflect the rate of improvement or new level of attainment of the performance being measured.

**Batch Processing.** The accumulation and processing together of groups of parts.

**Benchmark.** A qualitative and/or quantitative performance measure of an activity or activities at one or more enterprises that are considered best in class. A benchmark helps a DoD organization set and quickly achieve goals in a CPI implementation by applying the best practices associated with the benchmarked performance.

**Best Security Practice (BSP).** A security-related process that has been proven to be among the most effective practices to perform a given security function.

**Bottleneck.** Any resource with capacity equal to or less than the demand placed upon it.

**Brainstorming.** A method of unlocking creativity and generating ideas that is very effective for teams. In the first step, ideas are offered without the constraints of critical evaluation or judgment. After all ideas have been identified and listed, no matter how "far-fetched", the ideas are then critically evaluated to select the best ones.

**Breakdown Maintenance.** The time it takes to accomplish a fix after a breakdown occurs.

**Buffer.** Protection, measured in time, for a constraint or near constraint. A buffer provides assurance against starving a constraint.

**Buffer Penetration (or Buffer Incursion).** Projection of amount of buffer expected to be consumed.

**Buffer Stock.** Maintaining some small portion of finished products to satisfy variations in demand.

**Business Case.** A written description of the basis for implementation of a process improvement initiative, to include specific, measurable goals and objectives based on cost, performance, or schedule.

**Capability Maturity Matrix.** A framework for assessing organizational capability in terms of various characteristics (e.g. lean practices). Level 1 normally represents rudimentary capability and level 5 represents world-class industry leader capability.

**Capacity Constraint.** Anything that hinders process flow (the weak link in the chain).

**Capacity Management.** One of the nine USMC core business skills. The goal of Capacity Management is to ensure that resources are producing maximum value. Capacity Management provides information on how assets are currently being used, what resources are being wasted, and where potential improvements exist. Capacity Management focuses on identifying and addressing the causes of idle capacity, excess capacity, and ineffective capacity utilization. It makes capacity issues visible, understandable, and easier to manage across various levels of an organization.

**Cell.** A logical, efficient, and usually physically self-contained arrangement of the personnel and equipment required to complete a sequence of work. The cell enables flow and multi-process handling. Typically, each cell has a leader who manages the workflow and is responsible for maintaining performance and productivity.

**Cell Design.** The technique of creating and improving cells to optimize their work flow. A quality cell design results in improved space use, higher value-adding ratios, shorter lead times, lower work in process, and optimal use of employees.

**Champion.** A CPI Champion is typically the designated leader of CPI within the organization. Champions are critical to CPI organizational success, are needed at multiple levels, and have a strategic view of their organization. HICVS owners and key stakeholders assign their champions as members of the CPI working group.



**Commodity Teams.** Cross-functional groups charged with formulating Service wide commodity/supplier strategies that can be executed locally or strategically. Commodity teams use strategic purchasing principles and best practices to identify opportunities and to optimize purchase of goods and services for the Marine Corps on a local, regional, or enterprise basis.

**Communication Plan.** The strategy used to convey CPI concepts and information to all key personnel at every level with the objective of creating a culture of continuous improvement throughout the organization. The Communication Plan is an essential supporting plan to each organization's CPI Implementation Plan and is an appendix to this CPI Program Plan.

**Consequential Metric.** Metric(s) monitored to measure potential unintended results that may happen if a process is changed to positively impact the primary metric. Consequential metrics should be identified at the beginning of a project and monitored throughout.

**COP – Community of Practice.** In the Marine Corps, a group that shares common functional responsibilities and carries out similar activities, although they may be located in different organizations. COPs provide an opportunity for cross-feeding and sharing CPI information, best practices, and accomplishments. Nurturing and supporting COPs is key to accomplishing the key goal of creating a culture of continuous improvement in the Marine Corps.

**CONOPS. Concept of Operations.** Description of how an organization will implement a certain program or initiative.

**Constraint.** Any element or factor that prevents a system from achieving a higher level of performance relative to its goal.

**Core USMC Business Skills.** Nine core business skills that Marine Corps CPI Black Belts and Master Black Belts must possess. Definitions of each are included in this glossary:

- Activity-Based Cost Management
- Balanced Resource Management
- Capacity Management
- Extended Enterprise Management
- Integrated Performance Management
- Project Management
- Process Management
- Strategic Planning
- Target Cost Management

**Core Team.** The full-time personnel within an organization dedicated to CPI operations on a day-to-day basis. The Core Team is typically comprised of one-to-three percent of the organization's population.

**Corrective Action.** The action taken to reverse a downward trend in process performance metrics.

**Corrective Maintenance.** Improving or modifying equipment to prevent breakdowns or to make maintenance activities easier.



**CPI - Continuous Process Improvement.** A comprehensive philosophy of operations built around the concept that there are always ways in which a process can be improved to better meet the needs of the customer, and that an organization should constantly strive to make those improvements. In the Marine Corps, CPI involves an enterprise-wide focus on the continuous improvement of all business processes that support the warfighter (customer), and the integrated use of recognized best practices and tools such as Strategic Planning, Lean Six Sigma, Activity-Based Cost Management, Theory of Constraints, Balanced Resource Management, Integrated Performance Management, Balanced Scorecard, Extended Enterprise Management, and others. These tools have been effectively used to improve process capability and affordability in industry and several elements of DoD and DoN, and involve a structured approach that can be implemented in a consistent manner throughout the Marine Corps.

**CPI Certification Levels.** In the Marine Corps, there are three levels of certifications for CPI practitioners:

- **Level I – Green Belt.** Functional subject matter experts (SMEs) in any organization that serve part-time on CPI project teams formed to improve processes in their functional area. They may serve on project teams led by Black Belts, or they may lead a CPI project team part-time in their area of functional expertise.
- **Level II – Black Belt.** Certified, full-time positions responsible for leading CPI projects. These CPI experts are knowledgeable and highly skilled in the use of process improvement tools and methodologies, are proficient in facilitation and change management, and have the ability to guide subject matter experts in CPI projects will enhance support to the warfighter and improve the affordability of support processes. They have typically completed advanced training in process improvement and business tools, successfully completed several CPI projects and a national certification exam.
- **Level III – Master Black Belt.** Certified, full-time position(s) responsible for providing certification, training, and technical implementation support. Located in the CPI Support Teams or in major organizations, Master Black Belts are chosen for their ability to coach and teach CPI practitioners. They may also lead CPI projects (on a very limited basis) with high, enterprise-wide potential.

**CPI Maturity.** The degree of sustained process improvement in an organization across a defined set of process areas where performance improvement goals and metrics for measuring attainment of the goals are in place.

**Critical Chain.** The longest sequence of tasks in a project after resource contention has been resolved.

**Critical Chain Project Management (CCPM).** A process to plan and execute projects, combining the critical chain approach with traditional project management methodology. Addresses the root causes of why projects are routinely late and over budget.

**Critical Path.** Not considering the resource constraint, it's the longest set of dependent activities within a project.

**CTQ: Critical to Quality (Critical "Y").** Element of a process or practice which has a direct impact on its perceived quality

**Culture Change.** A major shift in attitudes, norms, sentiments, beliefs, values, operating procedures, and behavior of a group or organization.

**Current State.** Part of the Value Stream Analysis, this depicts the current or "as is" process and how it functions in terms of operations, materiel, and information flow.

**Customer.** Personnel and/or organizations for which a product or service is provided. There are internal and external customers. The external customer is the end user of an organization's product or service. Internal customers are those who take the results of some internal process step (e.g., a report, an electronic file, or other work output) as an input for their work. In some organizations, internal customers



are referred to as process partners because everyone in the organization should be working together to best serve the ultimate customer. In Marine Corps CPI, the warfighter is the ultimate customer.

**Customer Relationship Management (CRM).** A customer-centric strategy that is designed to help better understand and anticipate customer requirements.

**Cycle Time.** The time duration of a process. The beginning and end of a specific cycle time are defined as part of a CPI project and used to set the baseline for improvement goals and targets.

**Defects.** Sources of customer irritation. Defects are costly to both customers and to producers. Eliminating defects provides cost benefits.

**DMAIC.** Acronym for Define-Measure-Analyze-Improve-Control. DMAIC is an ordered process improvement methodology applied widely in private and public sector organizations. The phases of DMAIC guide a process improvement team logically from problem definition to implementing and sustaining process improvements.

**DoD.** U.S. Department of Defense. (If you don't know this, you are in trouble!)

**DoD CPI.** A strategic approach for enhancing support to warfighting capability by improving the cycle time, reliability, and affordability of support processes through the use of contemporary continuous improvement tools and methodologies.

**Do-It.** A desired change to the current state that can be done quickly and easily—usually in days.

**Driver.** An action that forces an expected reaction. Identifying and measuring the factors that are cost and performance drivers in a process is key to effective process improvement.

**Drum.** The detailed schedule for the control point resource that sets the pace for the entire system.

**Drum Buffer.** The buffer that protects the schedule of the drum.

**Drum-Buffer-Rope (DBR).** A process to plan and manage a process featuring the elements of a drum, a buffer, and a rope.

**Enterprise Architecture.** A management tool for coordinating activities and defining a support structure to achieve effectiveness and efficiency across the entire enterprise. It is mandated by law for federal agencies. EA is a description of the enterprise from a variety of perspectives that, taken together, facilitate the coordination of enterprise—spanning activities and provide a basis for aligning the structure, governance, and technical foundations of the enterprise.

**Enterprise Resource Planning (ERP).** A type of software package that consolidates all the information flowing through the enterprise from finance to human resources. ERP is being employed in DoD to standardize data, streamline the analysis process, and manage long-term planning with greater ease.

**Enterprise Value Stream Mapping and Analysis (EVSMA) or Enterprise Analysis and Action Planning (EA&AP).** A powerful tool for analyzing material and information flow throughout and between organizations in order to identify and plan improvements. EVSMA and EA&AP use simple diagrams to depict a current process and provide clarity to support process improvements. Organizations use these tools to plan CPI-related actions for improved effectiveness. Use helps participants from all parts of the organization to gain an understanding of the current process flow. See *Value Stream Map* below.

**Error-proofing.** A technique of preventing production errors by designing the process, equipment, and tools so that an operation literally cannot be performed incorrectly (see poke-yoke).

**Event.** A short-term, high-intensity effort to address a specific problem. The focus is typically a week, though the preparation normally begins several weeks in front and follow-up continues after. Also called by other names, including Rapid Improvement Event, Rapid Improvement Workshop, Kaizen Event, Kaizen Blitz, and Accelerated Improvement Workshop.



**Event Summary.** The summary provided to management of what was accomplished during an Event. This includes the resulting Action Plan/Transition Plan that outlines the actions required to establish the improved process.

**Extended Enterprise Management.** One of the nine USMC core business skills. It recognizes the network of entities required to effectively deliver products and services and create value for customers. Extended Enterprise Management extends process analysis, improvement, and management through all the organizational components of the larger organization as well as the outside entities that contribute to consistently delivering quality products and services in a timely manner.

**Facilitator.** Consultant, advisor, or subject matter expert that leads or supports the pace and direction of a team of CPI practitioners.

**Firefighting.** Also known as “tampering”. Using emergency fixes for process problems without eliminating the root cause or analyzing the process to bring it into control and improve it in an informed manner; managing by crisis instead of structured problem solving.

**Five S.** Traditional Lean approach to organizing and standardizing work in the workplace:

- Sort (organize)
- Stabilize (eliminate variations)
- Shine (clean)
- Standardize (make standard the best known way to do something)
- Sustain (consciously continue to work the previous four items)

[Note: Some organizations use the term **Six S**, which is Five S plus Safety.]

**Five Focusing Steps.** A process used to continuously improve organizational profit. The five steps are: 1) identify the system constraint, 2) decide how to exploit the system constraint, 3) subordinate all non-constraints to the system constraint, 4) elevate the system constraint, 5) repeat the process if the constraint is broken, while not allowing inertia to set in.

**Five Whys.** Practice of asking why five times in order to get to the root of the problem. Repeated questioning helps identify the root causes so effective countermeasures can be developed.

**Flow.** The sequential, coordinated movement of information, product, or service through a process.

**Flow Thinking.** Work areas are grouped and located close to each other to allow unimpeded and faster coordination.

**Flow Time.** The amount of time it takes a product, information or service to move through a process, including wait time.

**Footprint Space.** The amount of physical space required to execute a step in a process.

**Future State.** A vision of the optimum operating environment with new/improved processes in place.

**Gap Analysis.** An analysis that compares current performance to desired performance so solutions can be found to reduce the difference (close the gap).

**Goal, The.** Eliyahu M. Goldratt book that introduced Theory of Constraints..

**High Impact Core Value Stream (HICVS).** A term established by OSD and DoN guidance that represents core strategic processes. The Marine Requirements Oversight Council (MROC) approved 9 HICVS for the Marine Corps: Capability Development (or EFDS), Total Life Cycle Management, Acquisition, Aviation Materiel Life Cycle Management (or AIRSPEED), Human Resource Development, Resource Allocation, Installation Management, Information Technology, and Service Advocacy.



**HICVS Leader.** The MROC assigned a 2-3 star general “leadership” of each HICVS. “Leadership” includes responsibility to lead continuous process improvement across the entire value stream, which typically does cross organizational boundaries.

**Integrated Performance Management (IPM).** One of the nine USMC core business skills. IPM is an approach/tool that supports the implementation of Extended Enterprise Management and the organization’s Strategic Plan. IPM links organizational goals and objectives between the levels and across the processes of an organization and provides a balanced set of strategically aligned measures (displayed on a Balanced Scorecard) that drive continuous improvement, define and reinforce accountability, and emphasize the interdependencies of key processes. IPM is critical to successfully improving the complex web of interdependent business processes that support the warfighter.

**Internal Controls.** The process designed by leaders of an organization to help ensure accomplishment of organizational mission and goals.

**Just-in-time.** A strategy for inventory management in which materials and components are delivered from the vendor or supplier immediately before they are needed.

**Kaizen.** Continuous, incremental improvement of an activity to create more value with less waste – usually accomplished through the use of teams.

**Key Stakeholders.** Commanding Generals of Marine Forces Command, Marine Forces Pacific, Marine Forces Reserve, Marine Corps Logistics Command, Marine Corps Systems Command, and Marine Corps Recruiting Command. Share similar responsibilities as HICVS owners to lead continuous improvement within their commands across all HICVS.

**Lead Time.** Interval of time between the established need for something and its delivery.

**Lean Six Sigma.** A standardized, systematic approach to process improvement with two major aspects that work in conjunction to improve process performance and affordability:

- Lean focuses on process speed and throughput by eliminating waste and non-value added steps. Faster processes cost less, so there is an automatic cost benefit that occurs when process speed and performance is improved.
- Six Sigma focuses on reducing the level of variation from the customer requirement by reducing process defects, errors, and rework and by improving the reliability of the process. (See *Six Sigma* below for more information).

**Lean Enterprise.** An organization that performs its mission with little or no superfluous consumption of resources (materials, human capital, time, physical plant, equipment, information, or energy).

**Leverage Point.** The point in a process at which attention and/or application of resources would result in tangible improvements and benefits to the entire end-to-end value stream.

**Maintenance Prevention.** Designing/installing equipment that needs little or no maintenance.

**Management Review.** A report to management on progress made during a CPI Event.

**Manual Cycle Time.** The amount of hands-on time it takes to move a product or information through a process.

**Marine Corps Business Enterprise (MCBE).** The various business processes in the Marine Corps that support the warfighter comprise the MCBE. The MCBE includes functions such as logistics, material supply and services management, acquisition, real property and installation management, weapon systems life cycle management, combat service support, financial management, and human resources management. These processes span numerous organizations and levels in the Marine Corps and will be included in all CPI efforts.



**MC Rate - Mission Capable Rate.** A calculated rate that describes the portion of aircraft or vehicles that make up a weapon system that are, at least nominally, in a mission-ready condition. It excludes from consideration any aircraft or vehicles that have been shipped to a depot for repair. When the MC rate falls below a Service-defined target, then expediting becomes necessary to return the weapon system to mission-ready capability.

**Mission.** A concise, unambiguous, and measurable description of the organization's role in the overall objectives of the Marine Corps, DoN, and DoD.

**Monument.** Part of a process that cannot easily be altered because of physical constraints or legal or regulatory requirements.

**Non-Value-Added.** Any process activity that takes time, materiel or space, but does not add value to the product or service from the customer's perspective. For example, inspections or reviews normally are non-value-added because they are checking to see whether the work was done right in the first place. A non-value added process step violates at least one of the following value-added criteria;

- The customer would be willing to pay for the activity.
- All process steps must be done right the first time.
- Each process step must change (increase the value) of the product or service in some manner.

**Operational Plan.** The second of two key plans that guides all CPI efforts in DoD (the first being the strategic plan). Usually done at the organization level, the operational plan identifies the actions supporting CPI deployment and organizational transformation.

**Outcome.** The resulting effect of process outputs as they relate to an organization's mission and objectives. They are the critical performance measures to capture.

**Pareto Principle.** In 1906, Italian economist Vilfredo Pareto observed that twenty percent of the people owned eighty percent of the wealth. In the late 1940s, Dr. Joseph M. Juran inaccurately attributed the 80/20 Rule to Pareto, calling it Pareto's Principle. In general, the concept provides that for any given distribution of results, the majority of the distribution (80%) is determined by a small part (20%) of the potential contributors or causes. For example: one can expect that in a typical process, 80% or more of total process costs will be attributed to 20% or less of the cost drivers.

**Performance measure.** A measurable characteristic of a product, service, process, or operation that an organization uses to track and improve performance. The measure or indicator should be selected to best represent the factors that lead to improved customer satisfaction and operational and financial performance.

**PDCA.** Acronym for Plan-Do-Check-Act, a structured process improvement methodology similar to DMAIC.

**PM - Program Manager.** In DoD, the PM is in charge of logistics support for one or more specific weapon systems. Program managers, in collaboration with other key stakeholders establish logistics support program goals for cost, customer support, and performance parameters over the program life cycle.

**POA&M.** Acronym for Plan of Action and Milestones, a common management and reporting tool.

**Preventive Maintenance.** Actions taken to prevent breakdowns from occurring.

**Procedures and Checklists.** Typical outputs from CPI projects that specify steps required to successfully accomplish a process. Where they are absent, they are designed as part of CPI output. Where existing, procedures and checklists serve as the defined baseline for process improvement. In either case, procedures and checklist are an important process control tool.



**Process Cycle Efficiency (PCE).** A Lean metric derived by dividing the total time of the value-added steps in a process by the process lead-time (total duration of the process from beginning to end). Most unimproved processes run at less than 10% process cycle efficiency, which indicates the significant potential that exists for enhancing the processes that support warfighting through the application of CPI.

**Process Management.** One of the nine USMC core business skills. Process Management provides a horizontal view of how work flows through an organization and emphasizes how activities combine to provide the products and services customers require.

**Process Owner.** A commander or manager at any level of an organization with responsibility for the performance of that process or sub-process. "Owns" the process and the outcome of the process improvement project. The following major business process owner organizations manage the core business processes that comprise the Marine Corps Business Enterprise and support the warfighting capability of the Marine Corps. The leaders and managers in these various organizational components of the Marine Corps Business Enterprise have direct responsibility for CPI and project implementation and also act as Champions and Project Sponsors.

**Project Management.** One of the nine USMC core business skills. Project Management provides the framework for transforming leadership vision into reality. Effective Project Management focuses on providing overall direction, establishing specific goals, ensuring that adequate resources are available to accomplish project goals, providing effective communication and interaction with stakeholders, managing expectations, integrating conflicting or competing objectives, and orchestrating decision-making.

**Project Sponsor.** In Marine Corps CPI, Commanders or Staff Principals in all organizations that provide support of the Operating Forces are accountable for CPI results and act both as Champions and Project Sponsors. Project Sponsors receive executive-level familiarization training in the management and execution of CPI projects and are involved from the beginning in CPI project selection. They initiate specific projects by issuing project charters that specify the expected benefits and results, and agree in advance to support implementation and sustainment of process improvement. The Project Sponsor personally verifies that all proposed projects meet CPI Program standards and ensures the availability of resources (financial and personnel) to support project work. Project Sponsors review project progress and are responsible for executing and sustaining improvement results.

**Pull.** A system by which nothing is produced by the upstream supplier until the downstream process customer signals a need.

**Pull scheduling.** The flow of resources in a process by replacing only what has been consumed.

**Push.** A system by which suppliers produce arbitrary amounts of an item and advance it to the next stage in a process without regard for overall demand.

**Queue.** A line of jobs "at the ready" waiting for their turn at to be processed.

**Queue Time.** The amount of time a job waits during its production time.

**Rapid Improvement Event.** A short-term, high intensity effort to address a specific problem also called simply an Event. The focus is typically a week, though the preparation normally begins several weeks in front and follow-up continues after. Also called by other names, including Rapid Improvement Workshop, Kaizen Event, Kaizen Blitz, and Accelerated Improvement Workshop.

**Reliability.** Refers to the degree of certainty that a process will perform as intended over a set period of time.

**Return on Investment (ROI).** A term usually referring to the ratio between the savings or cost avoidance (the return) that will result from some action, and the cost of completing the action (the investment). In Marine Corps CPI, ROI can also refer to the return produced by CPI projects in improved process performance and enhanced support of the warfighter.



**RFT - Ready For Tasking.** Measure of the amount of an operational military unit's equipment is ready and capable of supporting the unit's current tasks. Expressed as a percentage only of the current requirement, not as a percentage of total. For example, if unit has 10 aircraft and 8 are needed on a given day but only 6 are capable of performing the task, then the ready-for-tasking rate is 75%.

**Root Cause Analysis.** Study of original reason for nonconformance with a process. When the root cause is removed or corrected, the nonconformance will be eliminated.

**Security Six Sigma.** A systematic approach that modifies the traditional Six Sigma approach to incorporate security concepts and make the methodology relevant for security professionals.

**Six Sigma (6σ).** Six Sigma focuses on reducing the level of variation from the customer requirement by reducing process defects, errors, and rework and thereby improving the reliability of the process. The level of variation from the customer requirement in process outputs is measured in Sigma levels and yields. The lower the yield, the greater the deviation from the customer requirement. Fixing the process improves the sigma levels with "six sigma" symbolizing an almost perfect process with only 3.4 defects per million opportunities:

<u>Sigma Level</u>	<u>Yield</u>
1	30.85%
2	69.15%
3	93.32%
4	99.38%
5	99.977%
6	99.99966%

**SMART.** Acronym for Specific-Measurable-Attainable-Results Focused-Timely. Used in setting objectives in CPI initiatives. Sound objectives meet all of the criteria in the SMART acronym.

**SME - Subject Matter Expert.** A recognized expert in a given functional area or subject.

**Stakeholder.** Person internal or external to an organization who has a stake in the outcomes of a process or other activity.

**Standard Deviation.** A statistical index of variability which describes the spread. A mathematical calculation that is the square root of variation.

**Standard Work.** An agreed set of work procedures that: effectively combine people, materiel, and machines to maintain quality, efficiency, safety, and predictability. Work is described precisely in terms of cycle time, work in process, sequence, time, layout, and the inventory needed to conduct the activity.

**Steering Committee(s).** CPI Steering committees are comprised of senior leaders and stakeholders who carry out CPI-related planning and policy development, identify strategic issues, develop program strategies, monitor program performance, provide guidance and business focus, establish CPI infrastructure, and support deployment of the Marine Corps CPI Program.

**Strategic Planning.** One of the nine USMC core business skills. Strategic planning is the process by which the leaders of an organization envision its future and identify the high-level actions to be taken over the timeline of the plan to make the vision a reality. The purpose of the strategic plan is to portray a comprehensive, integrated roadmap for an organization that supports its goals for completing its mission and ensuring its future viability. One of two key plans prescribed by DoD to guide CPI activity.

**Strategic Planning Terminology.**

- **Mission.** A concise, unambiguous, and enduring statement of purpose and description of the organization's role in the overall objectives of the Marine Corps.



- **Vision.** A clear description of the enhanced future state desired for the organization. The vision statement is a definition of success.
- **Guiding Principles.** A listing of the core values of an organization.
- **Strategic.** Of great importance to achieving the strategic vision and to assuring the long-term viability of the mission capability of the organization.
- **Strategic Themes.** Overarching, fundamental, strategic core outcomes that are central to the mission. In the Marine Corps CPI Program, the two strategic themes are enhancing support to the warfighter and achieving that through management excellence (continuous process improvement).
- **Strategic Goal.** A statement of a strategic result to be achieved in the long term and representing a major accomplishment. Strategic goals align with and support accomplishment of the strategic themes.
- **Strategies.** A major course of action an organization will pursue to implement a strategic goal.
- **Objectives.** Important individual actions and/or outcomes that support accomplishment of strategic goals.
- **Measure.** An indicator, taken over a period of time that provides vital information about the status of a process or activity. Measures portrayed on a strategic plan scorecard should drive appropriate leadership or management action.
- **Targets.** Numerical goals, often used on a strategic plan scorecard for driving implementation of the strategic plan.
- **Initiatives.** Specific actions or projects used to accomplish strategic objectives. Each objective may have one or more initiatives associated with it.

**Strategic Sourcing.** An OMB term that primarily refers to strategic purchase of goods and services. The USMC has developed and uses a seven step process to guide identification of strategic purchasing opportunities, to conduct analysis of the opportunities, and to implement improvements.

**Support Team.** The CPI support team is comprised of dedicated and ad hoc resources that facilitate and implement CPI planning and implementation. The support team may be organizationally based or be brought in as needed from other organizations (e.g., HQMC) or the commercial sector. In the Marine Corps, CPI Support Teams provided by HQMC and composed of full-time CPI experts are located in key geographic locations to provide general CPI implementation support to the various business process owner organizations. Other CPI support teams composed of internal resources exist in the major process owner organizations.

**Supply Chain Management (SCM).** In the Marine Corps, proactively directing the movement of materials and supplies from the source to delivery to supported organizations and personnel (customers). SCM aims to reduce operating costs, lead times, and inventory footprint and increase the speed of delivery, product availability, and customer satisfaction.

**Surge.** Rapid increase in demand.

**Systems Thinking.** Systems thinking focuses on how the component parts of a complex system interact to produce core outcomes. It differs from traditional forms of analysis that focus on each of the individual components. Systems thinking adds the enterprise view to process improvement, and is very effective in addressing complex enterprise-level business processes with myriad cross-functional and cross-organizational touch points. See *Marine Corps Business Enterprise*. Systems thinking, used in conjunction with Theory of Constraints, supports the identification of the key leverage points in a complex enterprise-wide process where targeted improvement actions will produce profound enterprise-wide benefits.



**Takt time.** **Takt** is a German term for rhythm. It is the available production time divided by the rate of customer demand. Takt time is the rate at which customers are demanding a product. This is NOT the same as cycle time.

**Tampering.** Also known as “firefighting”. Using emergency fixes for process problems without eliminating the root cause or analyzing the process to bring it into control and improve it in an informed manner; managing by crisis instead of structured problem solving.

**Target Cost Management.** One of the nine USMC core business skills. Target Cost Management recognizes that only a finite amount of money (the target cost) is available to operate a support process. Target Cost Management focuses on achieving process affordability while maintaining or actually improving process capability by using process improvement tools such as ABC and Lean Six Sigma that improve process performance and concurrently produce cost benefits and affordability. For example, Lean Six Sigma focuses on process speed and throughput by eliminating waste and non-value added steps. Faster processes cost less, so there is an automatic cost benefit that occurs when process speed and performance is improved. The ultimate purpose of Target Cost Management is to balance process cost and performance by “designing out” waste while maintaining or improving the required level of service for the warfighter customer.

**Theory of Constraints (TOC).** TOC provides a set of analytical tools and concepts for analyzing and improving complex interrelated processes and systems to improve overall system functioning and capability. TOC emphasizes that constraints exist in every process and control the output from the entire process. Used in conjunction with systems thinking,

**Total Lead Time.** Duration of a process from beginning to end.

**Total Productive Maintenance.** A set of techniques to ensure all equipment in a process is always able to perform its required tasks. Focused on avoiding and eliminating breakdowns or maintenance delays, and increasing capacity. Includes: Preventative Maintenance, Corrective Maintenance, Maintenance Prevention and Breakdown Maintenance.

**Total Quality Management (TQM).** A continuous process improvement philosophy and methodology involving perpetual improvement through fact-based management of all processes, practices, and systems throughout the organization to fulfill or exceed the customer expectations.

**Total Value-Added Time.** The total time in a process during which the value of the product going through the process is increased.

**Transition Plan.** The planning document that outlines the POA&M for completing a smooth and seamless transition to the new, improved process without disruption of support to the warfighter customer. Transition plans include as required: before/after tables of organization and staffing matrices, position descriptions, workforce communication plans, facilities and equipment requirements, IT system requirements, process performance metrics and targets, scorecard support requirements, and workforce skill development and training requirements.

**Value.** What the customer is, or would be willing, to pay for expressed in terms of a specific required product or service.

**Value-Added.** The parts of a process that add worth to the product or service provided to the customer or are absolutely required by the business and meet all the following criteria:

- The customer is, or would be willing to pay for this activity.
- Each step in the process must be done right the first time.
- Each value-added process step must change (increase the value) of the product or service in some manner.
- An absolutely essential part of the process.



**Value Stream.** The activities required to provide a product, service, or piece of information to the customer. In DoD, a term used to encompass all the planning, execution, activities, and services in an enterprise-wide or organization-wide process to create value for the customer.

**Value Stream Map.** Identification of all the specific activities occurring along a value stream for a product or service. A value stream map is distinct from a process map by mapping both material and information through the process.

**Variability.** An aspect of an item or process that is unstable or is inherently unpredictable.

**Visual Management.** Tools which allow management to quickly visually determine whether a process is proceeding as expected, or is in trouble (e.g., scorecard software).

**Voice of the Customer.** The "voice of the customer" is a process used to capture the requirements/feedback from the customer (internal or external) in order to provide the customers with the best in class service/product quality. This process focuses on being proactive and constantly innovative to capture the changing requirements of the customers with time. A foundational principal of CPI is that customer requirements should drive all CPI activity.

**Warfighter.** For Marine Corps CPI, the ultimate customer and the fundamental focus of all CPI activity.

**Waste.** Anything that adds cost or time to a process without adding value. The common forms of waste are best remembered by the acronym **TIMWOOD**:

- **Transportation** - moving products when it is not actually required to perform the processing.
- **Inventory** - all components, work-in-progress and finished product not actually being processed.
- **Motion** - people or equipment moving or walking more than is required to perform the processing.
- **Waiting** - waiting for the next process step.
- **Overproduction** - too much production or producing an item or delivering a service before it is actually required.
- **Over Processing** - due to poor tool or product design creating activity.
- **Defects** - the effort involved in inspecting for and fixing defects.

Other major causes of waste are:

- **Injuries** - Workplace injuries can significantly degrade process performance and cost.
- **Non Value-Added Process Steps.** See *Non-Value-Added* above.
- **Underutilization of Employees** - Failure of organizations to capitalize on employee creativity and knowledge.

**Work in Process (WIP).** At any given time, work items currently somewhere between the start and end of a process. In CPI, standardized work-in-process is the minimum number of work items needed to keep a process flowing smoothly.

**Work Group.** The work group is the key to implementation of CPI projects that improve support to the warfighter. Work groups are comprised of SMEs in the particular value stream being assessed and improved. Work group members have expertise in CPI tools, or the group is augmented with such capabilities.



*United States Marine Corps  
Continuous Process  
Improvement Guidebook*

**APPENDIX C  
CPI Training Plan**

December 26, 2007



**UNITED STATES MARINE CORPS  
CONTINUOUS PROCESS IMPROVEMENT  
GUIDEBOOK**

**APPENDIX C – CPI TRAINING PLAN**

December 2007



**TRAINING PLAN TABLE OF CONTENTS**

1. MISSION OF THE CPI TRAINING PROGRAM ..... 3

2. OBJECTIVES OF THE CPI TRAINING PROGRAM..... 4

3. USMC CPI TRAINING AND CERTIFICATION APPROACH..... 4

CPI LEVEL I (GREEN BELT) CERTIFICATION GUIDANCE..... 7

GREEN BELT BODY OF KNOWLEDGE..... 15

CPI LEVEL II (BLACK BELT) CERTIFICATION GUIDANCE..... 24

BLACK BELT BODY OF KNOWLEDGE..... 33

CPI LEVEL III (MASTER BLACK BELT) CERTIFICATION GUIDANCE..... 46

DEFINITIONS OF USMC NINE CORE BUSINESS SKILLS ..... 50

RECOMMENDED READING..... 53

**TRAINING PLAN FIGURES AND TABLES**

Figure 1 – USMC Business Capability Model..... 3

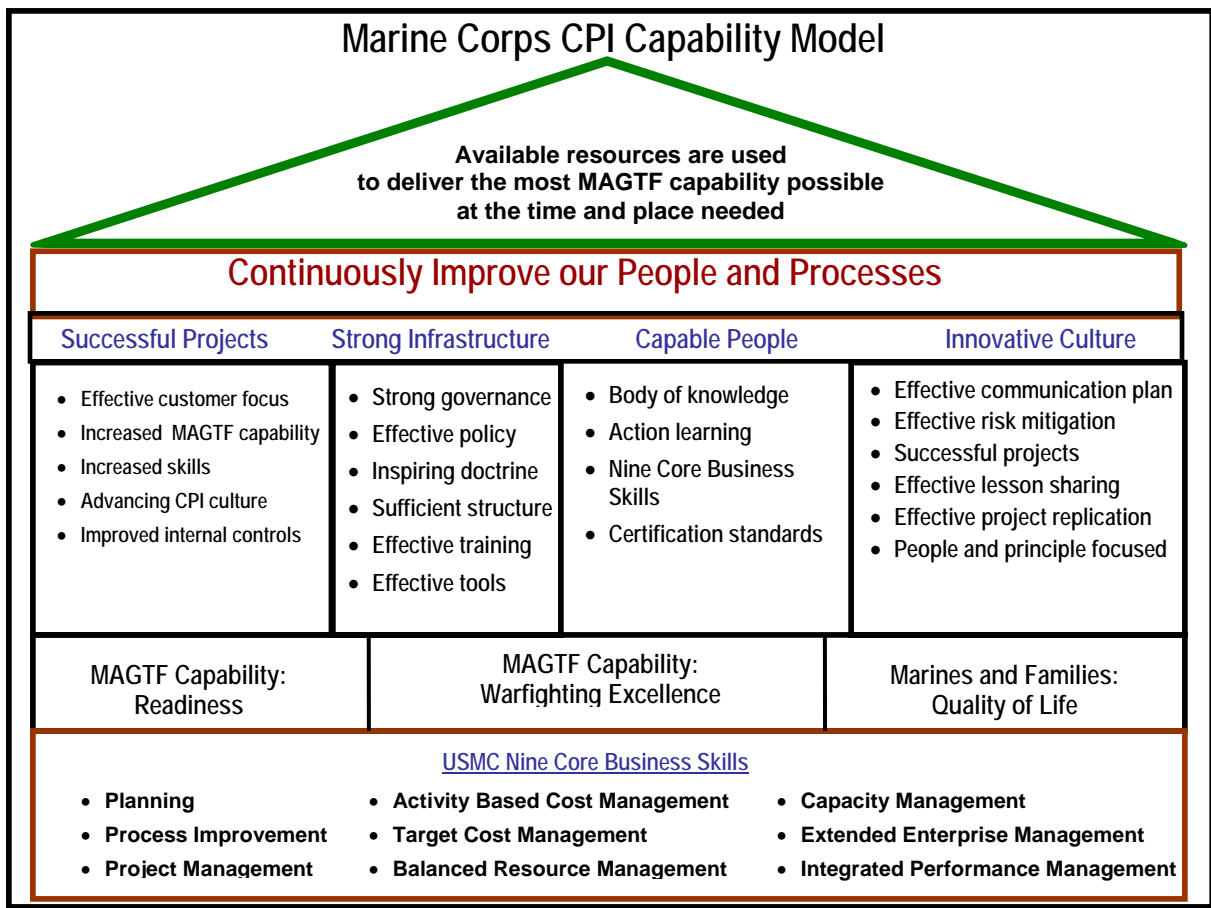
Table 1 – CPI Training Classes ..... 6



**1. MISSION OF THE CPI TRAINING PROGRAM**

The CPI Training Program supports the deployment and sustainment of continuous process improvement by identifying and/or providing training and certification focused on the development of critical knowledge, proficiencies, skills, and roles as defined in the Marine Corps Business Capability Model (Figure 1 below).

All training is intended to improve the processes that contribute to combat readiness and warfighting. CPI training is not an end in itself. Like ground school, most CPI training is designed with an object in mind, and requires demonstrated ability, in addition to class room training. The demonstrated ability occurs under mentorship of a CPI expert. Training delivery should be as flexible as the approved curriculum permits, and be aligned with the needs of the organization requesting the training.



**Figure 1 - USMC CPI Capability Model**



Objectives of the CPI training program

- a) Identify and/or provide training that promotes understanding of CPI concepts and application of CPI tools to personnel at all levels of the USMC.
- b) Establish criteria to achieve certification status as:
  - o CPI Level I (Green Belt)
  - o CPI Level II (Black Belt)
  - o CPI Level III (Master Black Belt)
- c) Prepare CPI practitioners to:
  - o Lead or participate on CPI project teams in support of command-specific initiatives or High Impact Core Value Stream (HICVS) analysis
  - o Perform successful analysis using an integrated set of CPI tools and techniques;
  - o Teach, coach and mentor others in the application of tools and methods; and
  - o Demonstrate the value of applying an integrated set of tools and techniques to garner significant return on investment for the USMC.

**2. USMC CPI TRAINING AND CERTIFICATION APPROACH**

The Marine Corps, in accordance with DoD and DoN standards, has established a training and certification program for continuous improvement. Marine Corps CPI training includes multi-level skill development that provides training in both CPI concepts and practical application of CPI tools. Training ranges from familiarization/introductory training for those new to CPI, to advanced training and certification for individuals who are leading CPI projects. The USMC recognizes Theory of Constraints Jonah certification and Jonah's Jonah certification, respectively, as basic and intermediate certification in CPI methodology.

The primary purpose of all CPI training is to generate and support successful CPI projects. It is Marine Corps policy that, to the maximum extent possible, CPI training produces tangible results that improve support to USMC war fighting readiness. Therefore, much of the training is provided to functional level CPI project team members during the actual conduct of CPI projects. This ensures the training provides a tangible benefit that offsets the training investment.

CPI training will be incorporated into officer and enlisted technical schools, post-graduate programs, pre-command seminars, and other appropriate venues as opportunities are available.

The CPI Training Program utilizes self-study, distance learning, classroom training, and Just-In-Time (JIT) training to address the training and educational needs of various CPI roles throughout the USMC. The Marine Corps currently partners with DoN/DoD entities and external training providers to provide CPI training. Over time, USMC-certified Black Belts and Master Black Belts will participate in conducting various levels of training. The Marine Corps will continue, however, to partner as needed with other DoN and DoD entities and/or external entities, to provide training.

All CPI training should be requested through the regional CPI Support Teams. POC information is available on the MCBEO website at <http://hqinet001.hqmc.usmc.mil/i&L/v2/LR/LRHome.htm>.



The CPI Training Program supports building awareness of CPI and also provides training to support senior leaders and practitioners in effectively implementing and applying CPI.

- **CPI Introductory/Familiarization Training** - This online training course on CPI concepts and tools is available through Navy Knowledge Online (NKO) and requires 4-6 hours of self-study. This is required training for all personnel in organizations that support war fighting readiness.
- **CPI Team Awareness Training** - This training provides CPI concepts and tools to project team members and is delivered Just-In-Time (JIT) by Black Belts or Master Black Belts during project implementation.
- **CPI Senior Leader/Project Sponsor Training** - A course for senior leadership, CPI Champions and CPI Project Sponsors in the concepts and methods for leading and supporting successful CPI projects. This training covers CPI concepts, project sponsorship, project charters, project management, and project reporting. Can also be delivered to mid-level leadership.
- **Basic Business Skills Training** - The Marine Corps, in partnership with a non-profit partner, developed a course of instruction, called IMPACT, to provide basic training in the nine USMC core business skills. This training is designed for civilian-Marine managers and supervisors from grades GS-9-13 and military equivalents. An Executive Overview is also available. This training provides the terminology, concepts and methodologies associated with each of the USMC nine core business skills (Process Analysis, Value Chain Management, Capacity Management, Activity Based Costing, Target Costing, Performance Management, Balanced Resource Management, Project Management, and Strategic Planning).
- **CPI Certification Standards** - The USMC has established criteria for CPI Level I (Green Belt), CPI Level II (Black Belt) and CPI Level III (Master Black Belt) certification as described in the next sections of this appendix. The CPI certification framework prepares CPI practitioners to effectively understand and apply increasingly advanced applications of integrated tools, and progressively accomplish more sophisticated analysis. Courses geared toward achieving certification are fully integrated with real-time project delivery, increasing the likelihood of significant return on training investment to the USMC. Rapid Improvement Events (RIE) or projects should be selected prior to training. RIE's and projects should be selected using the USMC Project Development Process or a similar strategic deployment approach that is consistent with DoD CPI doctrine. This approach maintains a focus on support of warfighting capability, engages key leaders to drive the effort, and ensures tangible and quantifiable improvements and results. All proposed CPI projects should:
  - Improve the processes that support combat readiness and warfighting capability.
  - Address the strategic priorities of the organization.
  - Address support priorities validated by the customer (warfighter).
  - Have the full support of key leaders and commanders prior to project commencement, including an advance commitment to implement and sustain the gains.
  - Target processes with significant ROI potential for improved performance and/or affordability with improved performance as the primary objective.

See *Appendix G, CPI Project Development Guide*, which provides additional guidance related to project selection.

Requirements for each level of certification are outlined in Appendices C-1, C-2, and C-3 of this Training Plan.



<b>Training Course</b>	<b>Target Audience</b>	<b>Duration</b>	<b>Providers</b>
Introductory	All military & civilian personnel	4-6 hours of on-line study	Navy Knowledge On-Line (NKO)
Team Awareness	Project Team Members	Varying	CPI Support Teams
Project Sponsor	Individuals responsible for leading/managing CPI projects within their organizations (Implementation Champions, Organizational Champions, Project Sponsors, Functional Managers, Department /Division Heads)	~ 5-16 hours	CPI Support Teams
Senior Leader Executive Overview	O6/GS15 and above	~ 4-8 hours	CPI Support Teams
Basic Business Skills (IMPACT)	Front-line managers and supervisors (Grades GS-9 – GS-13 & military equivalents)	40 hours	CPI Support Teams
CPI Level I (Green Belt)	Green Belt Candidates	40 hours	CPI Support Teams DoN partners
CPI Level II (Black Belt)	Black Belt Candidates	4-6 weeks	DoN partners
CPI Level III (Master Black Belt)	Master Black Belt Candidates	2-3 weeks	TBD

**Table 1– CPI Training Classes**

All CPI training should be requested through the regional CPI Support Teams. POC information is available on the MCBEO website at <http://hqinet001.hqmc.usmc.mil/i&L/v2/LR/LRHome.htm>.



## **CPI Level I (Green Belt) Certification Guidance**



### **CPI Level I (Green Belt)**

Role - Green Belts may be functional subject matter experts (SMEs) in any organization that serve part-time on ad hoc CPI project teams formed to improve processes in their functional area. They may serve on project teams led by Black Belts, or they may lead Rapid Improvement Events or CPI projects part-time in their area of functional expertise. Their value as CPI project team members is critical because they are the functional SMEs with intimate knowledge of the process and customer requirements. Their work on CPI projects is not viewed as additional work since their time and effort is built into their normal job duties as they routinely apply process improvement tools to get better results. Line managers, supervisors, or individual SMEs may earn this level of expertise. This level of expertise is encouraged as a requirement for permanent selection to leadership positions and is required to achieve Black Belt certification within the USMC.

#### **Certification Process**

Commanding Officers are responsible for certifying USMC Green Belts in their organizations, or may designate a representative from their command to perform certification. The Marine Corps Business Enterprise Office (MCBEO, LR) maintains the curriculum and testing standards for Green Belts and will work with Commanding Officers to ensure that knowledge requirements for Green Belts are met. Certificates should be issued by local Commands. USMC CPI Green Belt certificates are available from the CPI Program Office. POC information for HQMC and regional CPI Program Office personnel is available on the MCBEO website at <http://hqinet001.hqmc.usmc.mil/i&L/v2/LR/LRHome.htm>.

The Department of Navy Green Belt Body of Knowledge, presented on subsequent pages of this document, defines the training curriculum requirements for Green Belt training. The primary purpose of all CPI training is to generate and support successful process improvements. It is Marine Corps policy that all CPI training, to the greatest extent possible, be done in association with implementation of process improvements, and Rapid Improvement Events or projects should be selected prior to training.

In order to meet the criteria for training and testing for Green Belt certification, USMC personnel are encouraged to complete Green Belt training conducted by a DoN provider using the common DoN Green Belt curriculum.

Green Belts trained to the standards contained in the DoN Green Belt Body of Knowledge prior to the issue of this guidance are “grandfathered” if they have met additional Green Belt requirements as described on the following pages.

In addition to training and testing, Green Belt certification requires practical application. Green Belt certification requirements are as follows:

1. Attend Core Green Belt training (40 hours)
2. Pass training provider comprehensive test with minimum passing score of 75%
3. Facilitate **either**:
  - 4 Rapid Improvement Events (RIE)
  - **or** 2 DMAIC projects
  - **or** 1 DMAIC project and 2 Rapid Improvement events

Green Belts are expected to complete RIE’s or projects within one year after completion of training.

Commanding Officers (or their designated representative) are responsible for certifying Green Belts at their Command. The certification process should be tailored to the specific situation, but shall consist of the following as a minimum:

1. Green Belt candidates shall provide documentation sufficient to allow validation of all certification requirements. Standard checklists for Rapid Improvement Events and Projects are contained in this appendix.
2. As required, the Commanding Officer or their representative should consult with the responsible Black Belt, Process Owner, and/or Project Sponsor to validate the Green Belt’s successful completion of the RIE/project requirements. It is recommended, but not required, that all RIE/project work performed by Green Belts be reviewed and approved by a Black Belt.



3. The Commanding Officer or their representative shall document their recommendation for Green Belt certification. Standard certification checklists are included in this appendix.
4. Upon completion of the certification process, Green Belts are presented a USMC CPI Green Belt Certificate signed by the Commanding Officer and/or their representative. Standard USMC CPI Green Belt certificates are available from the USMC Regional Support Teams.

USMC CPI Regional Support Teams are available upon request to advise on the application of Green Belt certification standards, to provide Black Belt level review of project documentation, and to provide Green Belt certificates.

POC information for regional CPI Support Team members is available on the MCBE0 website at <http://hqinet001.hqmc.usmc.mil/i&L/v2/LR/LRHome.htm>.



## Selecting Green Belt Candidates

Green Belt candidate selection is an important step in ensuring that a CPI program provides the benefits intended. Finding Green Belt candidates with the right traits is a proven method for kick-starting any improvement initiative. Overlooking the importance of this step can lead to slow progress and incomplete results.

### Green Belt Candidate Traits

The Green Belt role requires candidates to demonstrate a skill set that includes starting and completing projects and using a data-based approach to solving practical problems. A list of these skills is outlined below:

- **Interest in Continuous Process Improvement** – Interest in process improvement initiatives is critical. Voluntary participation in the program and demonstration of quality consciousness in previous work experience are indicators for this criterion.
- **Passion** – Excitement about being part of the CPI culture change is essential. Passion brings the required dedication level.
- **Process orientation** – A willingness to understand the process view of the organization and to focus on the complete process instead of viewing things in isolation is important. Green Belts must visualize how different parameters and resources interact with each other to give a desired output.
- **Process knowledge** – Knowledge of the functional areas within the organization affected by the Lean Six Sigma events is especially important. Green Belt projects typically focus on localized improvements and Green Belt candidates are often subject matter experts within a specific functional area. Without sufficient knowledge about the organization, the Green Belt will find it difficult to complete the events or to gain acceptance from those who are involved in the process day to day.
- **Zeal to learn** – During CPI training, the Green Belt is taught many new tools and techniques. To gain confidence in using the methodology and tools, the Green Belt is required to practice the tools not only during training but also beyond training hours with live examples.
- **Team player** – Green Belts must be able to effectively work with and be part of a team. Green Belt team roles often include project manager and facilitator, in addition to analyst and subject matter expert.
- **Inclination toward data analysis** – CPI methods include Six Sigma, a data-based methodology using statistical calculations and techniques. Candidates are not required to have formal education in mathematics or statistics but an interest in mathematical analysis is desirable.
- **Customer orientation** – CPI is all about consistently meeting customer expectations. A Green Belt with little or no customer experience is less likely to appreciate this aspect of CPI.
- **Ability to spend required time** – The time Green Belts are required to spend on CPI events could potentially be anywhere from 30 percent to 50 percent of their total hours. If a Green Belt is responsible for service support, a key processing function or another critical project, CPI training and associated activities quickly become lower priorities. Selected candidates are expected to effectively participate in and complete CPI projects.

Note: This information was adapted from an article in iSixSigma by Sanjoy Kumar Parial.)



**CPI Level I (Green Belt) Certification Checklist**

Name \_\_\_\_\_

MILESTONE		DATE COMPLETED
	➤ Completed Core Green Belt training (40 hours)	
	➤ Passed Green Belt test with score of 75% or higher	
	<b>And has either:</b>	
	➤ Completed RIE 1	
	➤ Completed RIE 2	
	➤ Completed RIE 3	
	➤ Completed RIE 4	
	<b>or</b>	
	➤ Completed Project 1	
	➤ Completed Project 2	
	<b>or</b>	
	➤ Completed Project 1	
	➤ Completed RIE 1	
	➤ Completed RIE 2	

\_\_\_\_\_  
 Signature of Certifying Authority

\_\_\_\_\_  
 Date

**Green Belt candidate is responsible for providing documentation sufficient to allow validation of all certification requirements.**



**Rapid Improvement Event Checklist**

This checklist should be used as **guidance only**. Different tools may be used depending on the problem being addressed. It is recommended, but not required, that a certified Black Belt or Master Black Belt review and approve Green Belt Rapid Improvement Events.

<b>RIE Phase</b>	<b>Requirement</b>	
<b>Preparation</b> (Define)	Signed Charter	
	"As Is" Process Map, Flow Chart or Value Stream Map	
	Event Timeline/Schedule	
	Information related to Voice of the Customer (VOC) & Voice of the Business (VOB)	
	SIPOC	
<b>Implementation</b> (Measure, Analyze and Improve)	Documented use of <b>at least two</b> appropriate tools, such as:	
	• Brainstorming & Affinity Diagrams	
	• 5-Whys	
	• Pareto Chart	
	• Check Sheet Analysis	
	• Value Analysis	
	• Fishbone Diagram	
	• Scatter Diagram	
	• Histogram	
	• Process Control Charts	
	Future State Process Map, Flow Chart, or Value Stream Map	
Ideal State Process Map, Flow Chart, or Value Stream Map		
Documentation of Process Improvement Implemented.		
<b>Follow-up</b> (Control)	RIE Final Out-brief	
	Control Plan	
	Control Charts to Demonstrate Process Stability (If Applicable)	



### Green Belt Project Checklist

This checklist should be used as **guidance only**. Different tools may be used depending on the problem being addressed. It is recommended, but not required, that a certified Black Belt or Master Black Belt review and approve Green Belt projects.

DMAIC Step	Requirement	
<b>Define:</b>	Signed Project Charter	
	"As Is" Process Map, Flow Chart or Value Stream Map	
	Information related to Voice of the Customer (VOC) & Voice of the Business (VOB)	
	Identification of Input(s) "X's"	
	Identification of Output (Y)	
	Potential Project Timeline/Gantt Chart	
	Define Tollgate Review Documentation	
<b>Measure:</b>	Evidence of analysis performed, such as:	
	<ul style="list-style-type: none"> <li>• Summary Statistics</li> </ul>	
	<ul style="list-style-type: none"> <li>• Process Capability Analysis</li> </ul>	
	<ul style="list-style-type: none"> <li>• Summary Statistics</li> </ul>	
	<ul style="list-style-type: none"> <li>• Baseline Defects Per Million Opportunities (DPMO)</li> </ul>	
	<ul style="list-style-type: none"> <li>• Trend Charts, Run Charts</li> </ul>	
	<ul style="list-style-type: none"> <li>• Measurement System Analysis (MSA)</li> </ul>	
Measure Tollgate Review Documentation		
<b>Analyze:</b>	Documented use of <b>at least two</b> appropriate tools, such as:	
	<ul style="list-style-type: none"> <li>• Cause and Effect Diagram</li> </ul>	
	<ul style="list-style-type: none"> <li>• 5-Whys</li> </ul>	
	<ul style="list-style-type: none"> <li>• Check Sheet Analysis</li> </ul>	
	<ul style="list-style-type: none"> <li>• Value Analysis</li> </ul>	
	<ul style="list-style-type: none"> <li>• Process Control Charts</li> </ul>	
	<ul style="list-style-type: none"> <li>• Box Plots</li> </ul>	
	<ul style="list-style-type: none"> <li>• Failure Mode and Effects Analysis (FMEA)</li> </ul>	
	<ul style="list-style-type: none"> <li>• Regression &amp; Correlation Analysis</li> </ul>	
Analyze Tollgate Review Documentation		



**Green Belt Project Checklist**

<b>DMAIC Step</b>	<b>Requirement</b>	
<b>Improve:</b>	Documented use of <b>at least two</b> appropriate tools, such as:	
	• Brainstorming & Affinity Diagrams	
	• Force Field Analysis	
	• Benchmarking	
	• Error Proofing (Poka-Yoke)	
	• Piloting changes	
	Future State Process Map, Flow Chart, or Value Stream Map	
	Improve Tollgate Review Documentation	
<b>Control:</b>	Documented use of <b>at least two</b> appropriate tools, such as:	
	• Visual Controls	
	• 5S	
	• Standard Operating Procedures	
	• Training Plan	
	• Replication Application	
	• Follow-up Process Capability Analysis	
	• Control Charts to Demonstrate Process Stability	
	• Control Plan	
	Control Tollgate Review Documentation	



# **DEPARTMENT of NAVY GREEN BELT BODY OF KNOWLEDGE**



### **Levels of Cognition based on Bloom's Taxonomy – Revised (2001)**

In addition to **content** specifics, the subtext for each topic in this Body of Knowledge also indicates, at the end of each descriptor, the intended **complexity level** of the course content and test questions for that topic. These levels are based on “Levels of Cognition” (from Bloom's Taxonomy – Revised, 2001) and are presented below in rank order, from least complex to most complex.

#### **Remember**

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

#### **Understand**

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

#### **Apply**

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

#### **Analyze**

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.

#### **Evaluate**

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

#### **Create**

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn.



**DEPARTMENT of NAVY  
LEAN SIX SIGMA GREEN BELT BODY OF KNOWLEDGE (LEVEL I)**

**I. Enterprise-wide Deployment**

A. Enterprise view

1. History of organizational improvement  
Identify the origin of various continuous improvement tools including lean, six sigma, theory of constraints, etc. (Remember)
2. Foundations of Lean Six Sigma  
Describe the organizational value of Lean Six Sigma in terms of its philosophy and principles, and identify how lean tools, the DMAIC model, and the theory of constraints relate to each other. (Understand)
3. Business systems and processes  
Identify the interrelationships between organizational structure and processes. Describe how the selection and management of value streams relates to the organizational structure and processes, and confirm the link of value streams to organizational strategic plans. (Understand)
4. Suppliers, inputs, processes, outputs, customers (SIPOC)  
Describe how SIPOC can be used to identify appropriate value streams, based on how the value streams influence enterprise systems (e.g., cost, quality, schedule, financial paths, business flow, etc.). (Understand)

B. Leadership

1. Enterprise leadership  
Identify the roles and responsibilities of executive leadership and how their involvement can affect the deployment of Lean Six Sigma initiatives (e.g., providing resources, accountability, etc.). (Understand)
2. Lean Six Sigma roles and responsibilities  
Define the roles and responsibilities of Lean Champion, Black Belt, Master Black Belt, Green Belt, Value Stream Champion, process owners, customers, and stakeholders. (Understand)
3. Linking projects to organizational goals  
Describe how kaizen events or Rapid Improvement Events (RIE) are selected during the value stream analysis process. (Understand)

**II. Business Processes**

A. Process management and results

1. Basic process management  
Identify and describe the concept of process management, from defining the mission and vision through the attributes of process ownership. (Understand)
2. Process performance metrics  
Recognize the need for process performance metrics to determine how the process is performing. (Understand)
3. Benchmarking  
Define and distinguish between various types of benchmarking. (Understand)
4. Supply chain management  
Describe customer-supplier relationships and how these relationships and the supply chain are affected by project initiatives. (Understand)



5. Financial measures  
Define and use financial measures including return on investment (ROI) to underscore potential financial results. (Apply)
  6. Balanced Scorecard  
Describe how balanced scorecard is used to evaluate organizational goals against customer expectations and organizational processes. (Understand)
- B. Voice of the customer
1. Identify the customer  
Identify and segment various customers (e.g., internal, external, long-term, loyal, etc.) that will be impacted by changes to existing value streams. (Apply)
  2. Collect and validate customer data  
Determine which measurement method to use to collect customer feedback (e.g., surveys, focus groups, interviews, observation, etc.) in order to understand customer needs, expectations, and requirements, and use appropriate methods to ensure measurement validity and reliability (e.g., review questions for bias, ambiguity, etc.). (Apply)
  3. Customer data analysis  
Determine which graphical, qualitative, or statistical tools are most appropriate for analyzing customer data. (Understand).
  4. Identify critical to x (CTx) requirements  
Identify and use various metrics to evaluate product and process performance in terms of critical to...quality (CTQ), cost (CTC), process (CTP), safety (CTS), and delivery (CTD). (Apply)
- C. Change management
1. Organizational roadblocks  
Identify the inherent structures of an organization (such as its culture and construct) and describe how they become barriers to improvement. (Understand)
  2. Change agent  
Describe the role of change agent. (Understand)
  3. Motivation techniques  
Define and apply various techniques used to support and sustain participation in process improvement efforts. (Apply)
  4. Conflict resolution techniques  
Use various techniques to help conflicting parties recognize common goals and ways they can work together to achieve them. (Apply)
  5. Communication planning and deployment  
Develop and deploy communication plans that support process improvement efforts and will help prevent rumor, false expectations, and other obstacles from interfering with successful implementation of the change. (Apply)



### **III. Project Team Management**

#### **A. Initial steps**

1. Initiating teams

Describe and identify the elements required when launching a team (e.g., clear purpose and goals, commitment, ground rules, etc.) and how they affect the team's success (e.g., ability to gain support from management, team empowerment, team cohesion, etc.). (Apply)

2. Charter Negotiations (Chartering a team)

Determine the appropriate number and type of team members (e.g., skills sets, technical/subject-matter expertise, etc.) based on the team's charter and goals, and ensure appropriate representation of the stakeholders. (Apply)

3. Team roles

Define and describe team roles and responsibilities, including team leader, facilitator, etc. (Apply)

#### **B. Team stages**

Identify and facilitate the stages of team evolution (forming, storming, norming, performing, adjourning/mourning). (Apply)

#### **C. Team-building and facilitation techniques**

Apply various techniques (e.g., coaching, mentoring, intervention, etc.) to build and guide a team, and use appropriate tools to overcome common problems such as overbearing, dominant, or reluctant participants, the unquestioned acceptance of opinions as facts, groupthink, feuding, floundering, the rush to accomplish/finish, digressions, and tangents. (Evaluate)

#### **D. Team performance evaluation**

Measure team progress in relation to goals, objectives, and metrics that support team success, and recognize and reward accomplishments. (Analyze)

#### **E. Team tools**

Define, select, and apply the following creative and management and planning tools used by teams in various situations: brainstorming, nominal group technique, multi-voting, affinity diagrams, tree diagrams, etc. (Apply)



#### **IV. Define the Problem or Opportunity**

##### **A. Documentation and Presentation**

###### **1. Documentation elements**

Create data- and fact-driven process documents and determine appropriate tools for recording and using them (e.g., spreadsheets, storyboards, phased reviews, management reviews). (Create)

###### **2. Presentation**

Determine the appropriate style to use when communicating taking into account the target audience and the purpose of the presentation. (Apply)

##### **B. Charter and plan**

###### **1. Charter and plan elements**

Create a project charter and plan (including objectives, scope, boundaries, resources, transition, and closure) for a RIE. (Create)

###### **2. Charter negotiation**

Use various negotiation techniques when changes to the charter are proposed by various stakeholders and team members, and determine when it is appropriate to make changes to the charter. (Analyze)

###### **3. Execution**

Use various tools to track a RIE (e.g., TPR, newspaper, quad sheet, etc.) (Analyze)

##### **C. Mission, vision, and problem statement**

Develop a mission and vision statement for a RIE, and develop a problem statement containing a clear case for action and describing current and desired performance level of process. (Create)

##### **D. Project scope**

Identify the boundaries of a RIE using value stream maps, SIPOC, and other tools to align with the goals of the organization and to ensure that it has value to the customer. (Analyze)

##### **E. Project metrics**

Identify or establish process performance measurements that point to the critical elements of the process and can be connected to financial benefits. (Analyze)



## **V. Measure the Current State**

### **A. Process analysis**

1. Process inputs and outputs  
Identify process input variables and output variables, and document their relationships through cause and effect diagrams and data collection and analysis. (Evaluate)
2. Process flow and effective utilization  
Evaluate process flow and utilization by identifying the waste and constraints along the critical chain and analyzing work in progress (WIP), work in queue (WIQ), touch time, takt time, cycle time, and throughput. (Evaluate)
3. Tools  
Develop and review both higher and lower value stream maps, process maps, written procedures, work instructions, flowcharts, spaghetti diagrams, circle diagrams, etc. (Analyze)

### **B. Collecting and summarizing data**

1. Types of data  
Identify, define, classify and compare qualitative and quantitative data. (Evaluate)
2. Methods for collecting data  
Prepare data collection plans, and apply methods for collecting data using check sheets, data coding, automatic gauging, etc. (Apply)
3. Measurement scales  
Define and apply nominal, ordinal, interval, and ratio measurement scales. (Apply)
4. Techniques for assuring data accuracy and integrity  
Define and apply techniques for assuring data accuracy and integrity such as random sampling and stratified sampling. (Evaluate)

### **C. Basic statistics**

1. Descriptive statistics  
Define, compute, and interpret measures of dispersion and central tendency (mean, median, mode, variance, standard deviation, and z-values). (Evaluate)
2. Drawing valid statistical conclusions  
Distinguish between descriptive and analytical studies, and distinguish between a population and a sample statistic. (Evaluate)
3. Graphical methods  
Construct, apply, and interpret diagrams and charts such as run charts, pareto diagrams, histograms, normal probability plots, etc. (Evaluate)

### **D. Measurement systems**

1. Measurement methods  
Describe measurement systems and identify measurement methods for continuous and discrete data. (Understand)
2. Measurement system analysis (MSA)  
Determine measurement system capability by using tools such as repeatability and reproducibility studies. (Evaluate)

### **E. Statistical process control (SPC)**

1. Objectives and benefits  
Identify and explain the objectives and benefits of SPC (e.g., controlling process performance, distinguishing special from common causes). (Understand)
2. Analysis of control charts  
Interpret control charts and distinguish between common and special causes. (Analyze)



## **VI. Analyze the Data**

### **A. 7 Wastes**

Define and apply the classic 7 wastes: overproduction, inventory, defects, over-processing, waiting, motion, and transportation. Analyze value-added and non-value-added activities, and develop metrics and evaluate data to identify constraints in value flow. (Create)

### **B. Tools for identifying significant or root cause**

Describe, use, and interpret various root cause analysis tools, including (1) the five whys, (2) fishbone (Ishikawa) diagrams, and (3) the cause and effect matrix. (Evaluate)

## **VII. Improve the Process**

### **A. Eliminating Waste**

Define, describe and select the following tools and techniques for eliminating waste and improving processes: 1) Pull / Kanban, 2) 5S, 3) Flow, 4) Standard work, 5) Poka-yoke, 6) Cycle-time reduction, 7) Set-up time reduction, 8) reducing variation, 9) reducing complexity/steps. (Evaluate)

### **B. Theory of Constraints**

Describe and use Goldratt's process for identifying, exploiting, and elevating constraints, and explain how to subordinate non-constraints in a process. (Application)

### **C. Critical chain project management**

Define and use project buffer management, the drum-buffer-rope method, etc., and distinguish between critical chain and critical path. (Apply)

### **D. Implement the improved process**

#### **1. Plan the implementation**

Develop a plan for implementing the improved process. Identify the issues and roadblocks that may be encountered when the plan is implemented and determine the best methods for responding to those issues. (Evaluate)

#### **2. Conduct a pilot or a simulation**

Describe and apply the concepts required to conduct a pilot and identify the steps needed for a successful pilot or simulation. (Analyze)

#### **3. Select the optimum solution**

Analyze data collected from the pilot or simulation to determine the best solution. (Analyze)

#### **4. Roll out the optimum solution**

Implement a full-scale version of the improved process and monitor results. (Evaluate)



### **VIII. Control and Sustain the Improved Process**

#### **A. Implement and maintain controls**

1. **Process control plan**  
Develop a follow-up plan that will identify appropriate controls for ensuring/validating the ongoing success of the improved process. (Evaluate)
2. **Visual factory**  
Define the elements of visual factory and describe how they can help control the improved process. (Understand)
3. **Measurement system reanalysis**  
Recognize the need to improve or revise measurement system capability as process capability improves. Evaluate the use of control measurement systems, and ensure that measurement capability is sufficient for its intended use. (Evaluate)

#### **B. Sustain the improvement**

1. **Knowledge management and lessons learned**  
Identify and document the lessons learned and ensure that those lessons and process successes are disseminated to participants in future process improvement opportunities. Recognize how the improved process can be replicated and applied to other processes in the organization. (Apply)
2. **Training plan**  
Determine an appropriate training plan for ensuring the continued support of the improved processes. (Analyze)
3. **Monitor for new constraints**  
Identify the steps required to monitor the improved process for new constraints and additional opportunities for improvement. (Apply)



## **CPI Level II (Black Belt) Certification Guidance**



## CPI Level II (Black Belt)

Role - There are two categories of Black Belts:

- **Enterprise Black Belt.** Located in the CPI Support teams, Certified, full-time positions responsible for leading CPI projects that have significant enterprise-wide impact and potential. These CPI experts are knowledgeable and highly skilled in the use of integrated business tools and methodologies, are proficient in facilitation and change management, and have the abilities required to guide subject matter experts in efforts that will increase customer satisfaction levels and business productivity. They typically are Green Belt certified, have completed four – five weeks of Lean Six Sigma Black Belt training, have demonstrated mastery of LSS subject matter through the completion of an exam, and have demonstrated capability in two or more of the nine USMC core business skills. Enterprise Black Belts coach and assist Project Sponsors and less experienced CPI practitioners. It is generally expected that a Black Belt will move into a Master Black Belt or other significant business improvement role within 2-3 years.
- **Organization Black Belt.** May be located in a major command and report to the organizational Master Black Belt, or in a subordinate command as the senior CPI technical support member and report directly to the organization Commander. These are certified, full-time or part-time positions responsible for leading CPI projects in a specific organization. Organization Black Belts are expected to possess all skills and proficiencies as described above for Enterprise Black Belts.

### Black Belt Certification Process

Commanding Officers are responsible for selecting Black Belt candidates from their command. Commanding Officers are also responsible for submitting requests for Black Belt certification for individuals within their command to the CPI Program Office. The Commanding Officer may designate a representative within their organization to select Black Belt candidates and to submit Black Belt certification requests.

The Marine Corps Business Enterprise Office (MCBEO, LR) maintains the Black Belt curriculum and testing standards and will work with Commanding Officers to ensure that knowledge requirements for Black Belts are met.

The Department of Navy Black Belt Body of Knowledge, presented on subsequent pages of this document, defines the training curriculum requirements for Black Belt training. The primary purpose of all CPI training is to generate and support successful process improvements. It is Marine Corps policy that all Black Belt CPI training be done in association with project completion. Accordingly, Black Belt projects should be selected prior to training. It is recommended that project charters be submitted to the Master Black Belt training provider for review prior to the start of Black Belt training.

In order to meet the criteria for training and testing for Black Belt certification, USMC personnel are required to complete Black Belt training that covers all elements of the DoN Black Belt Body of Knowledge, which is included in this document.

Black Belts trained or certified, prior to this guidance, to the standards defined in the DoN Black Belt Body of Knowledge (or equal, as determined by gap analysis) are “grandfathered” if they have met additional Black Belt requirements as described on the following pages.

In addition to training and testing, Black Belt certification requires practical application. Black Belt certification requirements are as follows:

1. Black Belt candidates must have received DoN Core Green Belt training (or equivalent) prior to attending Black Belt training.
2. Attend Black Belt training covering DoN Black Belt Body of Knowledge (minimum 160 hours)
3. Pass training provider comprehensive test with minimum passing score of 75%
4. Lead one Rapid Improvement Event (RIE) and 2 DMAIC projects
5. Coach two Green Belts through one project each or two Rapid Improvement Events each.



The certification process should be tailored to the specific situation, but shall consist of the following as a minimum:

1. Black Belt candidates shall provide documentation sufficient to allow validation of all certification requirements.
2. All Black Belt projects and Rapid Improvement Events must be reviewed and approved by a Master Black Belt.
3. The Commanding Officer (or designated representative) shall:
  - Review documentation to validate the Black Belt's successful completion of training and testing requirements
  - As required, consult with the responsible Master Black Belt, Process Owner, and/or Project Sponsor(s) to review the Black Belt's completion of RIE and project requirements. Standard checklists for Rapid Improvement Events and Black Belt projects are included in this appendix.
  - Validate that requirements to coach Green Belts has been successfully completed.
  - Interview the Black Belt candidate to understand lessons learned.
4. The results of the review shall be documented. A standard certification checklist is included in this appendix.
5. Upon completion of the certification review, commands should submit requests for Black Belt certification to the CPI Program Office. Verification that all Black Belt certification requirements have been met must be included with certification requests.

#### **Expectations of USMC Black Belts**

- Black Belts lead CPI projects and Rapid Improvement Events, mentor and coach Green Belts and other CPI practitioners, provide classroom training or JIT training during project implementation, and perform other work directly related to Black Belt status.
- Enterprise Black Belts are full-time; Organizational Black Belts may be full-time or part-time.
- Black Belts typically are expected to work toward Master Black Belt certification.



## **Selecting Black Belt Candidates**

Black Belt candidate selection is a critical step in ensuring that a CPI program provides the benefits intended. Finding Black Belt candidates with the right traits is a proven method for kick-starting any improvement initiative. Using a qualitative rating matrix provides a systematic process for selecting Black Belt candidates. The process can make a significant difference in the effectiveness of the organization's CPI initiative.

### **Black Belt Candidate Traits**

The Black Belt role is leadership focused. Hence, the desired qualities in a Black Belt are different from those of a Green Belt. Middle managers are typically best suited for the role. Black Belt candidates should possess the following characteristics:

- **Interest in Continuous Process Improvement** – Interest in process improvement initiatives is critical. Voluntary participation in the program and demonstration of quality consciousness in previous work experience are indicators for this criterion.
- **Passion** – Excitement about being part of the CPI culture change is essential. Passion brings the required dedication level.
- **Business acumen** – A Black Belt must understand how different functions work together and influence the organization. Black Belt projects are usually large in scope and commonly involve multiple functions.
- **Zeal to learn** – During CPI training, the Black Belt is taught many new tools and techniques. To gain confidence in using the methodology and tools, the Black Belt is required to practice the tools not only during training but also beyond training hours with live examples.
- **Knowledge of/experience in a variety of CPI tools** – Black Belts select the appropriate tool for the specific issue or problem. Having knowledge and experience in a variety of tools/approaches is an advantage.
- **Technical aptitude** – A high level of technical skill in applying one or more improvement methodologies (Lean, Six Sigma, TOC, and others) within the organization is a key factor. Black Belts must have the ability to effectively apply whatever tool is selected for process improvement. Experience or education in statistics is beneficial to Black Belt candidates.
- **Problem-solving approach** – Candidates demonstrating cause-and-effect thinking and data-driven analysis in previous assignments are equipped in part for success as Black Belts.
- **Customer advocacy** – Black Belts should be able to effectively demonstrate and communicate concepts relating to defining customer expectations, identifying gaps in performance, taking proactive steps to meet customer needs and expectations, and monitoring performance on an on-going basis.
- **Team player/leader** – A Black Belt leads project teams, and in that role must direct team members, communicate effectively to multiple levels of organizational employees. Black Belts should understand team dynamics. Black Belts should be likeable and have good influencing skills. Black Belts assist organizations in implementing change, therefore excellent facilitation and communication skills are highly important.



- **Ability to train/mentor** – One of the most important functions of a Black Belt is to coach Green Belts during their project execution and to provide expert help so that possible roadblocks are proactively removed. Many CPI deployments also require Black Belts to conduct Green Belt and awareness training.
- **Project management** – Black Belts must be able to scope projects properly; manage project resources to meet deadlines; provide effective and timely communications to project team members, sponsors, champions and stakeholders; and perform all other aspects of project management. Project management experience is essential.
- **Ability to spend required time** – The time Black Belts are required to spend on CPI events could potentially be anywhere from 50 percent to 100 percent of their total hours. If a Black Belt is responsible for service support, a key processing function or another critical project, CPI training and associated activities quickly become lower priorities. Selected candidates are expected to effectively lead CPI projects.

Note: This information was adapted from an article in iSixSigma by Sanjoy Kumar Parial.)



**CPI Level II (Black Belt) Certification Checklist**

Name \_\_\_\_\_

MILESTONE		DATE COMPLETED
➤	Completed Core Green Belt training (min 40 hrs)	
➤	Completed Black Belt training (min 160 hrs)	
➤	Passed Black Belt test with score of 75% or higher	
➤	Completed RIE	
➤	Completed Project 1	
➤	Completed Project 2	
➤	Coached Green Belt 1	
➤	Coached Green Belt 2	

\_\_\_\_\_  
Signature of Certifying Authority

\_\_\_\_\_  
Date

**Black Belt candidate is responsible for providing documentation sufficient to allow validation of all certification requirements.**



**Rapid Improvement Event Checklist**

This checklist should be used as **guidance only**. Different tools may be used depending on the problem being addressed.

It is required that all Black Belt Rapid Improvement Events be reviewed and approved by a Master Black Belt.

<b>RIE Phase</b>	<b>Requirement</b>	
<b>Preparation</b> (Define)	Signed Charter	
	“As Is” Process Map, Flow Chart or Value Stream Map	
	Information related to Voice of the Customer (VOC) & Voice of the Business (VOB)	
	SIPOC	
<b>Implementation</b> (Measure, Analyze and Improve)	Documented use of <b>at least three</b> appropriate tools, such as:	
	• Brainstorming & Affinity Diagrams	
	• 5-Whys	
	• Pareto Chart	
	• Check Sheet Analysis	
	• Value Analysis	
	• Fishbone Diagram	
	• Scatter Diagram	
	• Histogram	
	• Process Control Charts	
	Future State Process Map, Flow Chart, or Value Stream Map	
Ideal State Process Map, Flow Chart, or Value Stream Map		
Documentation of Process Improvement Implemented.		
<b>Follow-up</b> (Control)	RIE Final Out-brief	
	Control Plan	
	Control Charts to Demonstrate Process Stability (If Applicable)	



**Black Belt Project Checklist**

This checklist should be used as **guidance only**. Different tools may be used depending on the problem being addressed. It is required that all Black Belt projects be reviewed and approved by a Master Black Belt.

DMAIC Step	Requirement	
<b>Define:</b>	Signed Project Charter	
	SIPOC	
	"As Is" Process Map, Flow Chart or Value Stream Map	
	Information related to Voice of the Customer (VOC) & Voice of the Business (VOB)	
	Identification of Input(s) "X's"	
	Identification of Output (Y)	
	Potential Project Timeline/Gantt Chart	
	CTQs Identified and Associated Operational Definitions	
	Define Tollgate Review Documentation	
<b>Measure:</b>	Evidence of analysis performed. Possible documentation includes:	
	• Measurement System Analysis (MSA)	
	• Sampling/Data Collection Plan	
	• Trend Charts/Run Charts/Time Series Analysis	
	• Baseline Defects Per Million Opportunities (DPMO)	
	• Summary Statistics	
	• Process Capability Analysis	
	Measure Tollgate Review Documentation	
<b>Analyze:</b>	Documented use of <b>at least five</b> appropriate tools, such as:	
	• Brainstorming & Affinity Diagrams	
	• Cause and Effect Diagram	
	• 5-Whys	
	• Check Sheet Analysis	
	• Value Analysis	
	• Process Control Charts	
	• Box Plots	
	• Hypothesis Testing	
	• Failure Mode and Effects Analysis (FMEA)	
	• Regression & Correlation Analysis	
	• ANOVA	
	• Design of Experiments	
Analyze Tollgate Review Documentation		



**Black Belt Project Checklist**

DMAIC Step	Requirement	
<b>Improve:</b>	Documented use of <b>at least four</b> appropriate tools, such as:	
	• Brainstorming & Affinity Diagrams	
	• Force Field Analysis	
	• Benchmarking	
	• Line/Task Balancing	
	• Error Proofing (Poka-Yoke)	
	• Set up Time Reduction	
	• Theory of Constraints	
	• Failure Mode and Effects Analysis (FMEA)	
	• Piloting changes	
	Future State Process Map, Flow Chart, or Value Stream Map	
Improve Tollgate Review Documentation		
<b>Control:</b>	Documented use of <b>at least four</b> appropriate tools, such as:	
	• Visual Controls	
	• 5S	
	• Standard Operating Procedures	
	• Training Plan	
	• Replication Application	
	• Total Productive Maintenance	
	• Follow-up Process Capability Analysis	
	• Control Charts to Demonstrate Process Stability	
	• Control Plan	
Control Tollgate Review Documentation		
<b>Project Closeout:</b>	Final project out-brief containing summary statement of project results	



**AMERICAN SOCIETY OF QUALITY (ASQ)/  
DEPARTMENT OF THE NAVY (DoN)  
BLACK BELT BODY OF KNOWLEDGE**



**AMERICAN SOCIETY FOR QUALITY / DEPARTMENT OF THE NAVY  
BLACK BELT BODY OF KNOWLEDGE**

The topics in this Body of Knowledge include additional detail in the form of subtext explanations and the cognitive level at which test questions will be written. This information will provide useful guidance for both the Examination Development Committee and the candidates preparing to take the exam. The subtext is not intended to limit the subject matter or be all-inclusive of what might be covered in an exam. It is meant to clarify the type of content to be included in the exam. The descriptor in parentheses at the end of each entry refers to the maximum cognitive level from Bloom's Taxonomy at which the topic will be tested. These levels are based on "Levels of Cognition" (from Bloom's Taxonomy – Revised, 2001) and are presented below in rank order, from least complex to most complex.

**Remember**

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

**Understand**

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

**Apply**

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

**Analyze**

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.

**Evaluate**

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

**Create**

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn.



## **I. Enterprise-wide Deployment [10 Questions]**

### **A. Enterprise view**

#### **1. History of organizational improvement**

Identify the origin of various continuous improvement tools including quality control, statistical process control (SPC), total quality management/leadership (including the 14 points), lean, six sigma, theory of constraints, etc. (Remember)

#### **2. Foundations of Lean Six Sigma**

Describe the organizational value of Lean Six Sigma in terms of its philosophy and principles, and identify how lean tools, the DMAIC model, and the theory of constraints relate to each other. (Understand)

#### **3. Business systems and processes**

Identify the interrelationships between organizational structure and processes. Describe how the selection and management of value streams relates to the organizational structure and processes, and confirm the link of value streams to organizational strategic plans. (Understand)

#### **4. Suppliers, inputs, processes, outputs, customers (SIPOC)**

Describe how SIPOC can be used to identify appropriate value streams, based on how the value streams influence enterprise systems (e.g., cost, quality, schedule, financial paths, business flow, etc.). (Understand)

### **B. Leadership**

#### **1. Enterprise leadership roles and responsibilities**

Identify the roles and responsibilities of executive leadership and how their involvement can affect the deployment of Lean Six Sigma initiatives (e.g., providing resources, accountability, etc.). (Understand)

#### **2. Lean Six Sigma roles and responsibilities**

Define the roles and responsibilities of black belt, master black belt, green belt, value stream champion, process owners, customers, and stakeholders. (Understand)

#### **3. Linking projects to organizational goals**

Describe how projects or kaizen events are selected, such as identifying constraints in the value stream and knowing when to use Lean Six Sigma instead of other problem-solving approaches. (Understand)



## **II. Business Processes [12 Questions]**

### **A. Process management and results**

#### **1. Basic process management**

Identify and describe the nine steps of the process management, from defining the mission and vision through acknowledging the team and reporting results. (Understand)

#### **2. Process performance metrics**

Recognize the effect that process performance metrics can have on enterprise decisions, such as how metrics propagate upward and allocate downward. (Understand)

#### **3. Benchmarking**

Define and distinguish between various types of benchmarking. (Understand)

#### **4. Supply chain management**

Describe customer-supplier relationships and how these relationships and the supply chain are affected by project initiatives. (Understand)

#### **5. Financial measures**

Define and use financial measures including net present value (NPV), return on investment (ROI), cost of quality (COQ), etc., to underscore potential financial results. (Apply)

#### **6. Balanced Scorecard**

Describe how balanced scorecard is used to evaluate organizational goals against customer expectations and organizational processes. (Understand)

### **B. Voice of the customer**

#### **1. Identify the customer**

Identify and segment various customers (e.g., internal, external, long-term, loyal, etc.) that will be impacted by changes to existing value streams. (Apply)

#### **2. Collect and validate customer data**

Determine which measurement method to use to collect customer feedback (e.g., surveys, focus groups, interviews, observation, etc.) in order to understand customers needs, expectations, and requirements, and use appropriate methods to ensure measurement validity and reliability (e.g., review questions for bias, ambiguity, etc.). (Apply) [NOTE: The collection of other types of data is included in area V.B.2.]

#### **3. Customer data analysis**

Determine which graphical, qualitative, or statistical tools are most appropriate for analyzing customer data. (Understand). [NOTE: The application of some of these tools is included in area V.]

#### **4. Identify critical to x (CTx) requirements**

Identify and use various metrics to evaluate product and process performance in terms of critical to...quality (CTQ), cost (CTC), process (CTP), safety (CTS), and delivery (CTD). (Apply)

#### **5. Quality function deployment (QFD)**

Define, interpret, and use a QFD chart in customer requirements analysis. (Apply)



C. Change management

1. Organizational roadblocks

Identify the inherent structures of an organization (such as its culture and construct) and describe how they become barriers to improvement. (Understand)

2. Change agent

Describe the role of change agent. (Understand)

3. Motivation techniques

Define and apply various techniques used to support and sustain participation in process improvement efforts. (Apply)

4. Conflict resolution techniques

Use various techniques to help conflicting parties recognize common goals and ways they can work together to achieve them. (Apply)

5. Communication planning and deployment

Develop and deploy communication plans that support process improvement efforts and will help prevent rumor, false expectations, and other obstacles from interfering with successful implementation of the change. (Apply)



### **III. Project Team Management [12 Questions]**

#### **A. Initial steps**

##### **1. Initiating teams**

Describe and identify the elements required when launching a team (e.g., clear purpose and goals, commitment, ground rules, etc.) and how they affect the team's success (e.g., ability to gain support from management, team empowerment, team cohesion, etc.). (Apply)

##### **2. Selecting team members**

Determine the appropriate number and type of team members (e.g., skills sets, technical/subject-matter expertise, etc.) based on the team's charter and goals, and ensure appropriate representation of the stakeholders. (Apply)

##### **3. Team roles**

Define and describe team roles and responsibilities, including team leader, facilitator, etc. (Apply)

#### **B. Team stages**

Identify and facilitate the stages of team evolution (forming, storming, norming, performing, adjourning/mourning). (Apply)

#### **C. Team-building and facilitation techniques**

Apply various techniques (e.g., coaching, mentoring, intervention, etc.) to build and guide a team, and use appropriate tools to overcome common problems such as overbearing, dominant, or reluctant participants, the unquestioned acceptance of opinions as facts, groupthink, feuding, floundering, the rush to accomplish/finish, digressions, and tangents. (Evaluate)

#### **D. Team performance evaluation**

Measure team progress in relation to goals, objectives, and metrics that support team success and recognize and reward accomplishments. (Analyze)

#### **E. Team tools**

Define, select, and apply the following creative and management and planning tools used by teams in various situations: brainstorming, nominal group technique, multi-voting, affinity diagrams, tree diagrams, various matrix diagrams and interrelationship digraphs, activity network diagrams, etc. (Apply)



**IV. Define the Problem or Opportunity [15 Questions]**

A. Documentation and Presentation

1. Documentation elements

Create data- and fact-driven project documents and determine appropriate tools for recording and using them (e.g., spreadsheets, storyboards, phased reviews, management reviews). (Create)

2. Presentation

Determine the appropriate style to use when communicating complex or technical issues (e.g., visual displays of data and information) taking into account the target audience and the purpose of the presentation. (Apply)

B. Charter and plan

1. Charter and plan elements

Create a project charter and plan (including objectives, scope, boundaries, resources, transition, and closure) for a kaizen event or Lean Six Sigma project. (Create)

2. Charter negotiation

Use various negotiation techniques when changes to the charter are proposed by various stakeholders and team members, and determine when it is appropriate to make changes to the charter. (Analyze)

3. Execution

Use various tools to track a Lean Six Sigma project or event (e.g., toll-gates, milestones, red flags, etc.). (Analyze)

C. Mission, vision, and problem statement

Develop a mission and vision statement for a project, and develop a problem statement containing a clear case for action and describing current and desired performance level of process. (Create)

D. Project scope

Identify the boundaries of project using value stream maps, SIPOC, and other tools to align with the goals of the organization and to ensure that it has value to the customer. (Analyze)

E. Project metrics

Identify or establish process performance measurements that point to the critical elements of the process and can be connected to financial benefits. (Analyze)



**V. Measure the Current State [34 Questions]**

**A. Process analysis**

1. Process inputs and outputs

Identify process input variables and output variables, and document their relationships through cause and effect diagrams, relational matrices, and data collection and analysis. (Evaluate)

2. Process flow and effective utilization

Evaluate process flow and utilization by identifying the waste and constraints along the critical chain and analyzing work in progress (WIP), work in queue (WIQ), touch time, takt time, cycle time, and throughput. (Evaluate)

3. Tools

Develop and review value stream maps, process maps, written procedures, work instructions, flowcharts, spaghetti diagrams, circle diagrams, etc. (Analyze)

**B. Collecting and summarizing data**

1. Types of data

Identify, define, classify and compare qualitative and quantitative data, continuous (variables) and discrete (attributes) data, and their types of distributions (binomial and Poisson). Identify opportunities to convert attributes data to variables measures. (Evaluate)

2. Methods for collecting data

Prepare data collection plans, and apply methods for collecting data using check sheets, data coding, automatic gauging, etc. (Apply)

3. Measurement scales

Define and apply nominal, ordinal, interval, and ratio measurement scales. (Apply)

4. Techniques for assuring data accuracy and integrity

Define and apply techniques for assuring data accuracy and integrity such as random sampling, stratified sampling, sample homogeneity, etc. (Evaluate)

**C. Basic statistics**

1. Central limit theorem

Define the central limit theorem and describe its significance in the application of inferential statistics for confidence intervals, control charts, etc. (Understand)

2. Descriptive statistics

Define, compute, and interpret measures of dispersion and central tendency (mean, median, mode, variance, standard deviation, and z-values), and construct and interpret frequency distributions and cumulative frequency distributions. (Evaluate)

3. Drawing valid statistical conclusions

Distinguish between enumerative (descriptive) and analytical (inferential) studies, and distinguish between a population parameter and a sample statistic. (Evaluate)

4. Graphical methods

Construct, apply, and interpret diagrams and charts such as box-and-whisker plots, run charts, scatter diagrams, histograms, normal probability plots, etc. (Evaluate)



- D. Measurement systems
  - 1. Measurement methods  
Describe measurement systems and identify measurement methods for continuous and discrete data. (Understand)
  - 2. Measurement system analysis (MSA)  
Determine measurement system capability by using tools such as repeatability and reproducibility studies, correlation, bias, linearity, etc. (Evaluate)
- E. Statistical process control (SPC)
  - 1. Objectives and benefits  
Identify and explain the objectives and benefits of SPC (e.g., controlling process performance, distinguishing special from common causes). (Understand)
  - 2. Selection of variable  
Identify and select critical characteristics for monitoring by control chart. (Apply)
  - 3. Rational sub-grouping  
Define and apply the principle of rational sub-grouping. (Apply)
  - 4. Selection and application of control charts  
Identify, select, construct, and use control charts, including  $\bar{X} - R$ ,  $\bar{X} - s$ , individual and moving range (ImR / XmR), p, np, c, and u. (Apply)
  - 5. Analysis of control charts  
Interpret control charts and distinguish between common and special causes using rules for determining statistical control. (Analyze)
- F. Analyzing process capability
  - 1. Designing and conducting process capability studies  
Identify, describe, and apply the elements of designing and conducting process capability studies, including identifying characteristics, identifying specifications and tolerances, developing sampling plans, and verifying stability and normality. (Evaluate)
  - 2. Calculating process performance vs. specification  
Distinguish between natural process limits and specification limits, and calculate process performance metrics (e.g., percent defective, parts per million (PPM), defects per million opportunities (DPMO), defects per unit (DPU), process sigma, rolled throughput yield (RTY), activity-based costing, etc). (Evaluate)
  - 3. Process capability indices  
Define, select, and calculate Cp and Cpk, and assess process capability. (Evaluate)
  - 4. Short-term and long-term capability studies  
Describe the appropriate assumptions and conventions to use when only short-term data or attributes data are available. Describe the changes in relationships that occur when long-term data are used. Describe and interpret the relationships between long-term and short-term capability. (Evaluate)
  - 5. Process capability for non-normal data  
Describe the cause of non-normal data and determine when it is appropriate to use a Box-Cox or other power transformation techniques. (Apply)
  - 6. Process capability for attributes data  
Calculate the process capability and process sigma level for attributes data. (Apply)



## **VI. Analyze the Data [25 Questions]**

### **A. 7 Wastes**

Define and apply the classic 7 wastes: overproduction, inventory, defects, over-processing, waiting, motion, and transportation. Analyze value-added and non-value-added activities, and develop metrics and evaluate data to identify constraints in value flow. (Create)

### **B. Measuring and modeling relationships between variables**

#### **1. Simple and multiple least-squares linear regression**

Describe and interpret the regression equation; apply and interpret hypothesis tests for regression statistics; use the regression model for estimation and prediction, and analyze the uncertainty in the estimate. (Evaluate) [NOTE: Models that have non-linear parameters will not be tested.]

#### **2. Simple linear correlation**

Describe and interpret the correlation coefficient and its confidence interval; apply and interpret a hypothesis test for the correlation coefficient. Describe the difference between correlation and causation. (Evaluate) [NOTE: Serial correlation will not be tested.]

#### **3. Diagnostics**

Analyze residuals of the model. (Analyze)

### **C. Basic hypothesis testing**

#### **1. Statistical vs. practical significance**

Define, compare, and contrast statistical and practical significance. (Evaluate)

#### **2. Significance level, power, type I and type II (Alpha and Beta) errors**

Apply and interpret the significance level, power, type I, and type II errors of statistical tests. (Evaluate)

#### **3. Sample Size**

Describe the impact of sample size for any given hypothesis test. (Understand)

#### **4. Null and alternate hypotheses**

Develop the null or alternate hypothesis as required in various situations. (Create)

#### **5. Probability (p) value**

Interpret p-value in rejecting or failing to reject null hypothesis. (Evaluate)

### **D. Advanced hypothesis testing**

#### **1. Point and interval estimation**

Define and interpret the efficiency and bias of estimators; interpret and draw conclusions from statistics such as standard error, tolerance intervals, and confidence intervals; distinguish between confidence intervals and prediction intervals. (Analyze)

#### **2. Tests for means, variances, and proportions**

Define and determine applicability of hypothesis tests for means (t-test, ANOVA, etc.), variances (F-Test, Levene's test, etc.), and proportions, and interpret results for significance of process inputs. (Evaluate)



3. Paired-comparison tests  
Define, determine applicability, and interpret paired-comparison parametric hypothesis tests. (Evaluate)
4. Goodness-of-fit tests  
Define, determine applicability, and interpret chi-square tests. (Evaluate)
- E. Failure mode and effects analysis (FMEA)  
Describe the purpose and elements of FMEA and how this tool is used for processes, products, and services. Distinguish between design FMEA (DFMEA) and process FMEA (PFMEA), and interpret data associated with each. (Analyze)
- F. Tools for identifying significant or root cause  
Describe, use, and interpret various root cause analysis tools, including (1) the five whys, (2) fishbone (Ishikawa) diagrams, and (3) the cause and effect matrix. (Evaluate)



## **VII. Improve the Process [30 Questions]**

### **A. Design of experiments (DOE)**

#### **1. Basic terms**

Define independent and dependent variables, factors and levels, response, treatment, error, repetition, and replication. (Understand)

#### **2. Planning and organizing experiments**

Describe and apply the basic elements of experiment planning and organizing, including determining the experiment objective, selecting factors, responses, and measurement methods, choosing the appropriate design, etc. (Evaluate)

#### **3. Design principles**

Define and apply the principles of power and sample size, balance, replication, order, efficiency, randomization and blocking, interaction, and confounding. (Apply)

#### **4. Design and analysis**

Construct full-factorial and fractional designs of experiments and interpret computational and graphical results. Describe the limitations of fractional factorials caused by confounding. (Evaluate) [NOTE: Response surface methodology and evolutionary operations (EVOP) will not be tested.]

### **B. Eliminating Waste**

Define, describe and select the following tools and techniques for eliminating waste and improving processes: 1) Pull / Kanban, 2) 5S, 3) Flow, 4) Standard work, 5) Poka-yoke, 6) Cycle-time reduction, 7) Set-up time reduction. (Evaluate)

### **C. Theory of constraints**

Describe and use Goldratt's process for exploiting and elevating constraints, and explain how to subordinate non-constraints in a process. (Application)

### **D. Critical chain project management**

Define and use project buffer management, the drum-buffer-rope method, etc., and distinguish between critical chain and critical path. (Apply)

### **E. Implement the improved process**

#### **1. Plan the implementation**

Develop a plan for implementing the improved process. Identify the issues and roadblocks that may be encountered when the plan is implemented and determine the best methods for responding to those issues. (Evaluate)

#### **2. Conduct a pilot or a simulation**

Describe and apply the concepts required to conduct a pilot and identify the steps needed for a successful pilot or simulation. (Analyze)

#### **3. Select the optimum solution**

Analyze data collected from the pilot or simulation to determine the best solution. (Analyze)

#### **4. Roll out the optimum solution**

Implement a full-scale version of the improved process and monitor results. (Evaluate)



### **VIII. Control and Sustain the Improved Process [12 Questions]**

#### **A. Implement and maintain controls**

##### **1. Control plan**

Develop a follow-up plan that will identify appropriate controls for ensuring the ongoing success of the improved process. (Evaluate)

##### **2. Total productive maintenance (TPM)**

Define TPM and its elements, and describe how it can be used as a control in the improved process. (Understand)

##### **3. Visual factory**

Define the elements of visual factory and describe how they can help control the improved process. (Understand)

##### **4. Measurement system reanalysis**

Recognize the need to improve or revise measurement system capability as process capability improves. Evaluate the use of control measurement systems, and ensure that measurement capability is sufficient for its intended use. (Evaluate)

#### **B. Sustain the improvement**

##### **1. Knowledge management and lessons learned**

Identify and document the lessons learned and ensure that those lessons and process successes are disseminated to participants in future process improvement opportunities. Recognize how the improved process can be replicated and applied to other processes in the organization. (Apply)

##### **2. Training plan**

Determine an appropriate training plan for ensuring the continued support of the improved processes. (Analyze)

##### **3. Monitor for new constraints**

Identify the steps required to monitor the improved process for new constraints and additional opportunities for improvement. (Apply)



## **CPI Level III (Master Black Belt) Certification Guidance**



### **CPI Level III (Master Black Belt)**

Role - There are two categories of Master Black Belts:

- **Enterprise Master Black Belt.** Certified, full-time position(s) responsible for providing certification, training, and technical implementation support to the Marine Corps CPI Program. Located in the regional CPI Support Teams, Master Black Belts typically have been Black Belt certified for several years, have completed additional Master Black Belt training and demonstrated mastery of advanced CPI subject matter through the completion of an exam, have demonstrated capability in four or more of the nine USMC core business skills, are certified instructors, and have successfully completed multiple CPI projects. Master Black Belts are chosen for their ability to coach, teach, and mentor all levels of CPI practitioners. They may also lead CPI projects (on a very limited basis) that have very high, enterprise-wide potential.
- **Organization Master Black Belt.** Certified, full-time position(s) responsible for providing certification, training, and technical CPI implementation support to the major organizational components of the Marine Corps. Internal to these organizations, they report directly to the organization Commander. Organizational Master Black Belts are chosen for their ability to coach, teach, and mentor organizational leaders and managers, Project Sponsors, and all other CPI practitioners. They may also lead CPI projects (on a very limited basis) that have very high potential and would result in the command-wide institution of best practices. All skills and proficiencies as described above for Enterprise Master Black Belt also apply.

#### **Certification Process**

Commanding Officers are responsible for submitting requests for Master Black Belt certification for individuals within their command via the chain of command to the Director, Marine Corps Business Enterprise Office (MCBEO, LR), who certifies all USMC Master Black Belts. The Commanding Officer may designate a representative within their organization to perform this function.

The Marine Corps Business Enterprise Office (MCBEO, LR) maintains the standards for Master Black Belts and will work with Commanding Officers to ensure knowledge requirements for Master Black Belts are met.

The DoN has not yet proposed Navy-wide certification standards for Master Black Belt. Until such time that a DoN standard is approved, the USMC will use the interim qualification criteria for Master Black Belts as described below.

USMC Master Black Belt certification requires practical application in project implementation, coaching, teaching, and consulting. Master Black Belt certification requirements are as follows:

1. Must be a certified Black Belt for a minimum of 2 years
2. Pass ASQ/DoN Black Belt certification exam
3. Complete two Rapid Improvement Events (RIE) and two DMAIC projects
4. Co-lead the following classes/courses. Rotate auditing and teaching modules with goal of being capable of teaching all course modules within 2 years.
  - 3 Black Belt courses (must participate in 3 full courses of 4-6 months each)
  - 2 Executive-level classes (Senior Leader, Champion, or Project Sponsor training)
5. Lead 1 Strategic Planning or Executive Planning session
6. Coach 9 Black Belts or Green Belts through 1 project each



The certification process should be tailored to the specific situation, but shall consist of the following as a minimum:

1. Master Black Belt candidates shall provide documentation sufficient to allow validation of all certification requirements.
2. The Commanding Officer (or designated representative) shall:
  - Review documentation to validate the Master Black Belt's completion of two DMAIC projects and two Rapid Improvement Events.
  - Validate that requirements to coach Green Belts and/or Black Belts have been successfully completed.
  - Validate that required teaching requirements have been met.
  - Validate the Master Black Belt's successful facilitation of a Strategic Planning or Executive Planning session.
  - Interview the Master Black Belt candidate to understand lessons learned.
3. The results of the review shall be documented. A standard certification checklist is included in this appendix.
4. Upon completion of the certification review, commands should submit requests for Master Black Belt certification via the chain of command to the Director, Marine Corps Business Enterprise Office (MCBEO, LR). Verification that all Master Black Belt certification requirements have been met must be included with certification requests.

Expectations of USMC Master Black Belt

- 100% of time is spent providing guidance, mentoring, coaching, teaching and project assistance to Green Belts, Black Belts, and other CPI practitioners.
- Expert in advanced application of integrated CPI tools and techniques.
- Ability to develop training materials and teach any level of CPI courses, and to conduct train-the-trainer sessions.

**Note: Standards and accompanying procedures for Master Black Belt certification may change once DoN common standards are adopted.**



**CPI Level III (Master Black Belt) Certification Checklist**

Name \_\_\_\_\_

MILESTONE	DATE COMPLETED
➤ Certified Black Belt for a minimum of 2 years	
➤ Passed ASQ/DoN Black Belt certification exam	
➤ Completed RIE 1	
➤ Completed RIE 2	
➤ Completed Project 1	
➤ Completed Project 2	
➤ Co-led Black Belt Course 1	
➤ Co-led Black Belt Course 2	
➤ Co-led Black Belt Course 3	
➤ Co-led Senior Leader/Executive Course 1	
➤ Co-led Senior Leader/Executive Course 2	
➤ Conducted Strategic Planning or Executive Planning session	
➤ Coached Black Belt/Green Belt 1	
➤ Coached Black Belt/Green Belt 2	
➤ Coached Black Belt/Green Belt 3	
➤ Coached Black Belt/Green Belt 4	
➤ Coached Black Belt/Green Belt 5	
➤ Coached Black Belt/Green Belt 6	
➤ Coached Black Belt/Green Belt 7	
➤ Coached Black Belt/Green Belt 8	
➤ Coached Black Belt/Green Belt 9	

\_\_\_\_\_  
 Signature of Certifying Authority

\_\_\_\_\_  
 Date

**Master Black Belt candidate is responsible for providing documentation sufficient to allow validation of all certification requirements.**



## **DEFINITIONS OF USMC NINE CORE BUSINESS SKILLS**



### **Activity Based Cost Management**

ABC/M is a cost management system that assigns cost to activities, services, and products and thereby provides critical resource allocation information about warfighting support processes in a manner not possible with standard Government accounting systems. In Marine Corps CPI, ABC is used in concert with process improvement tools like Lean Six Sigma to effectively manage the balance of cost and performance in processes that support the warfighter.

### **Balanced Resource Management**

There are three categories of resources available to any organization: financial capital, physical assets, and intellectual capital; or simply - money, things and people. The key elements of balanced resource management are accurately identifying and articulating budget and manpower requirements; effective budget execution and alignment of resources to strategic priorities; and process improvement (since waste can consume up to 75% of the typical business process).

### **Capacity Management**

Capacity Management provides information on how assets are currently being used, what resources are being wasted, and where potential improvements exist. The goal of Capacity Management is to ensure that resources are producing the maximum value. Capacity Management focuses on identifying and addressing the causes of idle capacity, excess capacity, and ineffective capacity utilization. It makes capacity issues visible, understandable, and easy to discuss across various levels of an organization.

### **Extended Enterprise Management**

Extended Enterprise Management recognizes the network of entities required to effectively deliver products and services and create value for customers. Extended Enterprise Management extends process analysis, improvement, and management through all the organizational components of the larger organization as well as the outside entities that contribute to consistently delivering quality products and services in a timely manner.

### **Integrated Performance Management**

Effective Performance Management is an approach/tool that supports the implementation of Extended Enterprise Management and the organization's Strategic Plan. IPM links organizational goals and objectives between the levels and across the processes of an organization and provides a balanced set of strategically aligned measures (displayed on a Balanced Scorecard) that drive continuous improvement, define and reinforce accountability, and emphasize the interdependencies of key processes. IPM is critical to successfully improving the complex web of interdependent business processes that support the warfighter.

### **Project Management**

Project Management provides the framework for transforming leadership vision into reality. Effective Project Management focuses on providing overall direction, establishing specific goals, ensuring that adequate resources are available to accomplish project goals, providing effective communication and interaction with stakeholders, managing expectations, integrating conflicting or competing objectives, and orchestrating decision-making.



## **Process Management**

Process Management provides a horizontal view of how work flows through an organization and emphasizes how activities and processes combine to provide the products and services customers require. Benefits of effective Process Management include: reduced process cycle times, improved process reliability and security, increased/enhanced quality of outputs, less time and money spent on wasteful or nonproductive activities, reduced overhead costs, improved affordability of products and services, increased ability to meet emerging requirements, enhanced quality of work life for employees, and increased customer satisfaction. Process management in the Marine Corps encompasses the use of multiple proven management and improvement methodologies. Three primary tools used are:

- Lean - Focuses on reducing waste
- Six Sigma - Focuses on reducing variation and increasing quality
- Theory of Constraints (TOC) - Focuses on identifying and eliminating constraints in a process

## **Strategic Planning**

Strategic planning is the process by which the leaders of an organization envision its future and identify the high-level actions to be taken over the timeline of the plan to make the vision a reality. The purpose of the strategic plan is to portray a comprehensive, integrated roadmap for an organization that supports its goals for completing its mission and ensuring its future viability. One of two key plans prescribed by DoD to guide CPI activity.

## **Target Cost Management**

Target Cost Management recognizes that only a finite amount of money (the target cost) is available to operate a support process. Target Cost Management focuses on achieving process affordability while maintaining or actually improving process capability by using process improvement tools such as ABC and Lean Six Sigma that improve process performance and concurrently produce cost benefits and affordability. For example, Lean Six Sigma focuses on process speed and throughput by eliminating waste and non-value added steps. Faster processes cost less, so there is an automatic cost benefit that occurs when process speed and performance is improved. The ultimate purpose of Target Cost Management is to balance process cost and performance by “designing out” waste while maintaining or improving the required level of service for the warfighter customer.



## **RECOMMENDED READING**



### **Introductory**

- *DoD Continuous Process Improvement Transformation Guidebook*, March 2006
- *What is Lean Six Sigma*, by George, Rowlands and Kastle
- *Demystifying Six Sigma*, by Alan Larson

### **Champions**

- *DoD Continuous Process Improvement Transformation Guidebook*, March 2006
- *Lean Thinking: Banish Waste & Create Wealth in Your Corporation* by Womack & Jones
- *What is Lean Six Sigma*, by George, Rowlands and Kastle
- *Lean Six Sigma for Service*, by Michael George
- *The Goal*, by Eli Goldratt
- *Better Thinking, Better Results*, by Bob L. Emillani
- *The Elegant Solution: Toyota's Formula for Mastering Innovation*, by Matthew May and Kevin Roberts
- *High Velocity Culture Change*, by Pritchett & Pound

### **Green Belts**

- *DoD Continuous Process Improvement Transformation Guidebook*, March 2006
- *Black Belt Memory Jogger*
- *Lean Enterprise Memory Jogger*
- *Memory Jogger II*
- *All I Need to Know About Manufacturing, I Learned in Joe's Garage*, by William B. Miller & Vicki Schenk

### **Black Belts**

- *DoD Continuous Process Improvement Transformation Guidebook*, March 2006
- *Lean Thinking: Banish Waste & Create Wealth in Your Corporation* by Womack & Jones
- *The Six Sigma Way*, by Pande, Neuman, and Cavanagh
- *Basic Statistics*, by Kiemele, Schmidt, and Berdine (Air Academy Press)
- *The Goal*, by Eli Goldratt
- *The Visual Display of Quantitative Information*, by Edward Tufte
- *Visual Explanations*, by Edward Tufte
- *The Effective Facilitator*, by Leadership Strategies Inc.
- *High Velocity Culture Change*, by Pritchett & Pound
- *Gemba Kaizen*, by Masaaki Imai
- *The Elegant Solution: Toyota's Formula for Mastering Innovation*, by Matthew May and Kevin Roberts
- *Black Belt Memory Jogger*
- *Lean Enterprise Memory Jogger*



### Recommended Reading By Topic

#### Activity Based Cost Management

- *Activity Accounting*, by Jim Brimson
- *Value Quest*, by CAM-I, Chapter 11
- *Implementing ABM in Daily Operations*, by John Miller
- *Common Cents*, by Peter Turney
- *Cost & Effect*, by Kaplan & Cooper

#### Balanced Resource Management

- *Value Quest*, by CAM-I, Chapter 6
- *Managing Strategic and Capital Investment Decisions*, by CAM-I

#### Capacity Management

- *Value Quest*, by CAM-I, Chapter 7
- *Implementing Capacity Cost Management Systems*, IMA publication #4LL
- *Measuring the Cost of Capacity*, IMA publication #4Y
- *Capacity Measurement & Improvement*, by Thomas Klammer
- *Total Capacity Management*, by C.J. McNair

#### Change Leadership

- *Managing at the Speed of Change*, by Daryl Conner
- *Leading at the Edge of Chaos*, by Daryl Conner
- *Leading Change*, by John Kotter
- *The Leader's Guide to Change Management*, by Lawrence Miller
- *Managing Change Effectively*, by Donald Kirkpatrick
- *Building the Bridge as You Walk On It*, by Robert Quinn
- *The Power of Full Engagement*, by Jim Loehr and Tony Schwartz

#### Continuous Process Improvement

- DoD Continuous Process Improvement Transformation Guidebook, March 2006
- *The Toyota Way*, by Jeffrey Likert
- *The Toyota Way Fieldbook*, by Liker and Meier
- *The Elegant Solution: Toyota's Formula for Mastering Innovation*, by Matthew May and Kevin Roberts
- *The GE Way*, by Jack Welch
- *Out of the Crisis*, by W. Edwards Deming
- *From Baldrige to the Bottom Line: A Road Map for Organizational Change and Improvement*, by David W. Hutton
- *Improving Performance*, by Geary A. Rummler and Alan P. Brache

#### Integrated Performance Management

- *The Balanced Scorecard*, by Kaplan & Norton
- *The Balanced Scorecard: Step by Step*, by Paul Niven
- *Keeping Score*, by Mark Graham Brown
- *Winning Score*, by Mark Graham Brown
- *Essentials of the Balanced Scorecard*, by Mohan Nair
- *Measuring Performance*, by Bob Frost
- *Performance Based Management* by Judith Hale
- *Serious Performance Consulting* by Geary A. Rummler

#### Extended Enterprise Management

- *Balanced Sourcing*, by Timothy Laseter
- *Shared Services: Mining for Corporate Gold*, by Barbara Quinn, et. al.
- *The Connected Corporation*, by Jordan Lewis
- *Value Quest*, by CAM-I, Chapter 9
- *Developing Lean Supply Chains—A Guidebook*, by Phelps, et. al



### **Lean Six Sigma**

- *Six Sigma Journey, From Art to Science*, by Larry Walters
- *The Six Sigma Way*, by Pande, Neuman, and Cavanagh
- *Demystifying Six Sigma*, by Alan Larson
- *What is Lean Six Sigma*, by George, Rowlands and Kastle
- *Lean Six Sigma for Service*, by Michael George
- *Lean Six Sigma Pocket Toolbook*, by Michael George
- *The Six Sigma Handbook* by Thomas Pyzdek
- *Lean Thinking: Banish Waste & Create Wealth in Your Corporation* by Womack & Jones
- *Personal Efficiency Program*, by Kerry Gleeson

### **Project Management**

- *Improving Your Project Management Skills: the Basics for Success*, by American Management Association
- *A Guide To The Project Management Body Of Knowledge*, by Project Management Institute

### **Process Analysis**

- *Reengineering the Corporation: A Manifesto for Business Revolution*, by Hammer & Champy
- *X-engineering the Corporation*, by James Champy
- *Learning to See: Value Stream Mapping to Add Value & Eliminate Muda*, by Rother & Shook
- *Understanding Variation* by Donald Wheeler

### **Strategic Planning**

- *A Field Guide to Focused Planning: Hoshin Kanri-American Style* by Joseph F. Colletti
- *The Art of the Long View*, by Peter Schwartz

### **Systems Thinking**

- *The Fifth Discipline*, by Peter Senge
- *The Fifth Discipline Fieldbook*, by Peter Senge
- *Systems Thinking Basics*, by Anderson & Johnson
- *The One Straw Revolution*, by Masanobu Fukuoka

### **Target Costing**

- *Value Quest*, by CAM-I, Chapter 5
- *Target Costing*, by CAM-I Interest Group
- *Hitting the Target*, by CAM-I Interest Group
- *Implementing Target Costing*, Management Accounting Guideline # 28

### **Team Building**

- *The Wisdom of Teams: Creating the High-Performance Organization (Collins Business Essentials)* by Jon R. Katzenbach and Douglas K. Smith
- *The Effective Facilitator*, by Leadership Strategies Inc.
- *The Leadership Challenge*, by Kouzes and Posner

### **Theory of Constraints**

- *The Goal*, by Eli Goldratt
- *Theory of Constraints* by Eli Goldratt

### **USMC Corps Heritage**

- *The Marine Corps Way*, by Santamaria, Martino, and Clemons
- *First to Fight*, by General Victor H. Krulak



**UNITED STATES MARINE CORPS  
CONTINUOUS PROCESS IMPROVEMENT  
GUIDEBOOK  
APPENDIX D  
CPI COMMUNICATION PLAN**

**Background**



This plan provides information on the actions that will be taken to support Marine Corps Continuous Process Improvement with effective communication and information.

The primary purpose of USMC Continuous Process Improvement (CPI) is to enhance all aspects of the support provided to the Marine Air-Ground Task Force (MAGTF) in order to maximize their combat readiness and warfighting capability. Enhanced support to the warfighters will be achieved by continuously improving all key support processes through the application of process improvement tools to reduce cycle times, provide optimum reliability, and ensure affordability. Marine Corps CPI is aligned with similar DoD CPI program and DoN process improvement efforts, which have the same goal of continually improving all functions that support warfighting capability, while ensuring affordability.

Marine Corps CPI is a major initiative that will involve a wide range of organizations and personnel to enhance the performance of all business processes that support the warfighter. Continuous process improvement is a primary responsibility of all commanders, key leaders, and managers in every Marine Corps organization responsible for providing support to the MAGTF. CPI will engage everyone in these organizations to actively implement and support continuous improvement of all support operations to enhance the combat readiness and warfighting capability of the Marine Corps.

Leadership and effective communication are critical elements in the success of Marine Corps CPI. This Communication Plan emphasizes the key role of leaders in all organizations that support the warfighter in leading the overall CPI effort through effective communication with all members of their organization. This leadership and communication will support the development of a culture of continuous improvement throughout the workforce. Every member of the workforce will be part of this culture that advocates highly effective and affordable support to the MAGTF, and this Plan emphasizes the sharing of workforce success stories in order to rapidly build and expand support for continuous process improvement.

## **Goal of the CPI Communication Plan**

The goal of the Marine Corps CPI Communication Plan is to support a self-sustaining culture of continuous improvement in every Marine Corps organization that is focused on providing highly effective and affordable support to the warfighting capability of the Marine Corps.

## **Audiences**

The primary target audiences of this Communication Plan are:

- Leaders at all levels in every organization that provides support to the Operating Forces
- The workforce in every organization that provides support to the Operating Forces
- Senior Marine Corps leaders
- DoN and DoD leaders
- Local and national employee union leadership
- Congress (members and staffers)
- Stakeholders (contractors, local community and business leaders)
- Selected media representatives



## **Communications Objectives**

Enterprise-wide understanding, support, and active endorsement of CPI efforts are critical to the success of CPI. This Communication Plan provides the framework to convey information related to CPI deployment, methods, projects, and benefits in a proactive, structured, and timely manner, and to foster collaborative knowledge-sharing across the workforce. The objectives of the CPI Communication Plan are to:

- Promote awareness of the benefits of CPI and generate interest in the use of CPI tools and methods throughout the Marine Corps, ultimately resulting in a self-sustaining workforce culture of continuous process improvement focused on providing excellent support to the warfighter.
- Provide leaders, managers, and the workforce with information about CPI implementation, resources, on-going efforts, results, and success stories.
- Disseminate timely and relevant information about CPI training and events, projects, methods, standards, and tools.
- Utilize technology to provide a means for CPI practitioners to collaborate and share knowledge.

## **Communication Plan Assumptions**

- All audiences will have various degrees of initial skepticism about the potential benefits of CPI and may view it as another “management” or cost cutting program rather than an initiative to enhance support of Marine Corps warfighting capability.
- The Marine Corps civilian workforce may fear job losses from CPI.
- All audiences will need to see tangible results to be convinced of the benefits of continuous process improvement.
- USMC, DoN, and DoD leaders will expect tangible results from CPI.

## **Communication Strategy**

The fundamental communications strategy is to proactively emphasize that the primary purpose of CPI is to enhance support to the warfighter rather than cost cutting, and that Marine Corps CPI is aligned with and supports the overarching DoN and DoD CPI and process improvement mandates.

## **Initial CPI Communication Actions**

- Conduct Executive-level training.
- Director, Marine Corps Business Enterprise Office meets with key senior leaders to share information and develop strategy for CPI deployment.
- Establish enterprise-level CPI Working Group composed of representatives of all major business process owner organizations
- Publish the USMC CPI Guidebook with supporting plans for project implementation, training, communication, and risk mitigation to all pertinent organizations.
- Execute USMC CPI policy directives:
  - ACMC Message
  - MARADMINS
  - Marine Corps Order



- Director, MCBE Office conduct web seminars/teleconferences with USMC Business Performance Office Managers
- Establish web-based CPI Portal to serve as the key communication means for CPI practitioners and to provide all Marine Corps personnel with CPI information.
- Provide additional executive level training and briefings.
- Provide CPI Green Belt training in conjunction with projects.

## **Ongoing CPI Communication Actions**

The following ongoing communication actions will ensure CPI practitioners have access to vital information as they engage in CPI project implementation.

- Publish progress and success stories in newsletters, bulletins, and other appropriate venues
- Participate in seminars, presentations and meetings that provide opportunities to discuss general information on CPI and communicate progress and successes.
- Incorporate USMC-specific CPI information, progress and successes into training sessions (Team Training, Green Belt, Black Belt, Executive-level, Senior Leaders Course, etc.)
- Develop fact sheets for most frequently asked questions to establish common key strategic messages about CPI.
- Develop and disseminate a brochure explaining CPI objectives, methods, points of contact, and other pertinent information.
- Maintain a generally accessible web-based CPI Portal with the following information:
  - Key Points of Contact (POCs)
  - Frequently asked questions (FAQ)
  - Fact sheets
  - Training opportunities
  - Schedules of events
  - Projects in progress
  - Success stories
  - CPI implementation reference documents
  - Project-level reference documents
  - Project-level tools and templates
  - Recommended reading
  - Form to submit nominations for awards/recognition (may be a project or a person)
  - Learning materials (self-tests, JIT training modules, etc.)
  - Links to other related sites
- Incorporate a collaborative platform for CPI practitioners into the CPI Portal to:
  - Communicate, collaborate, and share knowledge with other CPI practitioners
    - Access/update/communicate lessons learned
    - Access/communicate project results
    - Ask questions, share knowledge, and access common key messages
    - Leverage individual and collective results
  - Access resources
    - Access/enhance standard tools and templates
    - Access standard presentations, training materials, and reference materials
    - Review information from other projects



**Communication Tools and Tactics:**

Following is a list of communication tools and tactics that can be used by leaders to communicate information about CPI and assist them in leading the overall effort:

<b>Media</b>	<b>Primary Purpose(s)</b>	<b>Frequency</b>	<b>Target Audience</b>
CPI Program Directives <ul style="list-style-type: none"> <li>• ACMC Message</li> <li>• MARADMINs</li> <li>• CPI Guidebook</li> <li>• MCO</li> </ul> Video Presentation by Top Leader(s) E-Mail/P4	<ul style="list-style-type: none"> <li>• Engage USMC Leadership</li> <li>• Engage all personnel with a uniform message</li> </ul>	I Initial  Continuous  Continuous	<ul style="list-style-type: none"> <li>• All leaders and personnel in organizations supporting the MAGTF</li> <li>• All leaders and personnel</li> <li>• Top USMC Leaders</li> </ul>
CPI web-based Portal	<ul style="list-style-type: none"> <li>• Central repository and access point for all CPI information/resources:               <ul style="list-style-type: none"> <li>- Implementation info</li> <li>- Progress reports</li> <li>- Project information</li> <li>- Success stories</li> <li>- Practitioner tools &amp; Templates</li> <li>- Access to CPI Spt resources</li> <li>- FAQs</li> </ul> </li> <li>• Practitioner collaboration</li> </ul>	Continuous	<ul style="list-style-type: none"> <li>• Internal USMC – All personnel but with specific forums/workspaces for CPI practitioners</li> </ul>
CPI Brochure	<ul style="list-style-type: none"> <li>• Promote general awareness</li> <li>• Explain CPI objectives and methods</li> <li>• Provide POCs</li> </ul>	As required	<ul style="list-style-type: none"> <li>• Internal - USMC-wide</li> <li>• External - DoD entities, stakeholders, etc.</li> </ul>
CPI Newsletter	<ul style="list-style-type: none"> <li>• Publicize progress</li> <li>• Highlight successes</li> <li>• Provide information on/schedules for training and events</li> <li>• Promote general awareness</li> </ul>	Monthly	<ul style="list-style-type: none"> <li>• Internal - Enterprise-wide</li> <li>• External - DoD entities, stakeholders, etc.</li> </ul>
CPI Fact Sheets	<ul style="list-style-type: none"> <li>• Post and maintain FAQs on CPI Web Portal</li> </ul>	Continuous	<ul style="list-style-type: none"> <li>• Internal - Enterprise-wide</li> </ul>



**United States Marine Corps  
Continuous Process  
Improvement Guidebook**

**APPENDIX D  
CPI Communication Plan**

December 21, 2007

<b>Media</b>	<b>Primary Purpose(s)</b>	<b>Frequency</b>	<b>Target Audience</b>
CPI Bulletins	<ul style="list-style-type: none"> <li>• Highlight successes</li> <li>• Provide information on/schedules for training and events</li> <li>• Provide information on topics of interest (new books, implementation tips, lessons learned, new courses, etc.)</li> </ul>	Quarterly Or As-Req'd	<ul style="list-style-type: none"> <li>• Internal - Enterprise-wide</li> </ul>
Award/recognition ceremonies	<ul style="list-style-type: none"> <li>• Promote general awareness</li> <li>• Recognize and celebrate successes</li> </ul>	TBD	<ul style="list-style-type: none"> <li>• CPI practitioners</li> <li>• CPI Project Sponsors and Champions</li> </ul>
USMC Business Performance Manager Meetings	<ul style="list-style-type: none"> <li>• Promote general awareness</li> <li>• Receive feedback from field representatives</li> <li>• Share lessons learned</li> </ul>	Quarterly	<ul style="list-style-type: none"> <li>• Business Managers</li> <li>• BPO Staff members</li> </ul>
New Installation Commanders Course	<ul style="list-style-type: none"> <li>• Outline CPI objectives and methods</li> <li>• Introduce CPI tools</li> <li>• Highlight successes</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• New Installation Commanders and CoS</li> </ul>
CPI training events	<ul style="list-style-type: none"> <li>• Share information</li> <li>• Report progress</li> <li>• Highlight successes</li> </ul>	Varying	<ul style="list-style-type: none"> <li>• Organization CPI Teams</li> <li>• CPI practitioners</li> <li>• Senior leaders</li> </ul>
Internal CPI meetings	<ul style="list-style-type: none"> <li>• Share information</li> <li>• Perform implementation planning</li> <li>• Review deployment status</li> <li>• Develop policies and procedures</li> <li>• Share lessons learned</li> </ul>	Varying	<ul style="list-style-type: none"> <li>• Organization CPI Teams</li> <li>• CPI Working Group</li> </ul>
DoD or USMC briefings/meetings	<ul style="list-style-type: none"> <li>• Collaborative working groups</li> <li>• Share information</li> <li>• Determine implementation reqts</li> <li>• Participate in policy development</li> </ul>	Varying	<ul style="list-style-type: none"> <li>• DoN TTL Working Grps               <ul style="list-style-type: none"> <li>- Communications WG</li> <li>- Tools WG</li> <li>- Training &amp; Educ. WG</li> <li>- Metrics WG</li> </ul> </li> </ul>
Executive briefings/meetings	<ul style="list-style-type: none"> <li>• Report implementation status</li> <li>• Determine implementation reqts</li> <li>• Report success stories</li> <li>• Develop/finalize policies</li> </ul>	Varying	<ul style="list-style-type: none"> <li>• BTESG meetings</li> <li>• MROC meetings</li> <li>• IAB meetings</li> <li>• EOS meetings</li> <li>• DoN TTL meetings</li> </ul>
External speaking engagements	<ul style="list-style-type: none"> <li>• Promote general awareness</li> <li>• Highlight successes</li> </ul>	Varying	<ul style="list-style-type: none"> <li>• Meetings</li> <li>• Conferences</li> <li>• Seminars</li> </ul>



## Questions and Answers About Marine Corps CPI

### 1. What is the purpose of Marine Corps CPI?

**Answer:** The primary purpose of USMC CPI is to enhance all aspects of the support provided to the Marine Air-Ground Task Force (MAGTF) in order to maximize their combat readiness and warfighting capability. Enhanced support to the warfighters will be achieved by continuously improving all key support processes through the application of process improvement tools to reduce cycle times, provide optimum reliability, and ensure affordability. Marine Corps CPI is aligned with DoD CPI and DoN process improvement efforts, which have same primary goal of continually improving all functions that support warfighting capability, while ensuring affordability.

Marine Corps CPI translates DoD and DoN CPI guidance into plans that are compatible with the Marine Corps culture and environment while ensuring conceptual and strategic alignment. While affordability is an issue that must be addressed, the primary focus of Marine Corps CPI is improving support to the warfighter, not cost reduction.

### 2. How is CPI different than other previous “management” programs?

**Answer:** Many management improvement programs in the past simply provided widespread training in generalized management or process improvement concepts but failed to provide a structured and consistent method for their application. These previous efforts also failed to provide a method for identifying high priority or high potential targets linked to the primary mission of warfighting support and often focused only on cost cutting.

Marine Corps CPI is entirely focused on enhancing support to the warfighters, not cost reduction. It involves an enterprise-wide focus on continuous improvement of all business processes that support the warfighter and will employ the integrated and structured use of recognized best practices and tools such as Strategic Planning, Lean Six Sigma, Activity-Based Cost Management, Theory of Constraints, Balanced Resource Management, and scorecards among others. These tools have improved capability and affordability in industry and in several elements of DoD and DoN, and they involve a structured approach that can be implemented in a consistent manner throughout the Marine Corps. A standard USMC Project Development Process is used for selecting high value projects and just-in-time training will be provided in conjunction with the conduct of high value process improvement projects using the standard DMAIC project management methodology.

### 3. Who is responsible for implementing continuous process improvement?

**Answer:** DoD, DoN, and USMC CPI guidance emphasize the responsibility of leaders in every organization that provides support to the warfighter to continuously improve that support with CPI.

The Commandant and Assistant Commandant of the Marine Corps have responsibility for initiating, driving, and supporting CPI from the executive level. As the “Champions” for CPI, they set high-level objectives, help maintain the momentum of implementation, and obtain support and endorsement at the executive level.

Leaders at all levels in all the following major organizations that provide support to the MAGTF are accountable for CPI results and act as Champions and Project Sponsors. They have direct responsibility for CPI project implementation. The organizations are:

- AVN
- C4
- I&L
- INSTALLATIONS
- LOGCOM
- MCCDC
- MCIs
- MCSC
- MCRC
- M&RA
- P&R
- PP&O
- TECOM



#### 4. How will continuous process improvement be applied in the Marine Corps?

**Answer:** The Marine Corps has adopted a three-part CPI implementation strategy:

- Conduct strategically aligned CPI projects in enterprise-level high-impact core value streams.
- Continue/accelerate CPI effort in Air and Ground Logistics functions.
- Conduct high-impact organization-level and regional-level process improvement projects. Value streams comprise all the work and activity that produce the products and services required to support warfighting capability. The enterprise-level value streams that support warfighting capability in the Marine Corps are known as High Impact Core Value Streams (HICVS) and are illustrated below.

This complex supporting enterprise with myriad process interfaces and touch points requires continuous process improvement in order to effectively support Marine Corps warfighting capability. As outlined below, numerous functional areas and organizations in the Marine Corps will participate in CPI activities. The leaders of these major supporting organizations act as advocates and owners of the HICVSs and are responsible for using CPI to improve the performance of the overall value stream, even though it may cross organizational lines.

#### 5. What will ensure CPI projects produce real results?

**Answer:** USMC CPI employs a standard Project Development Process that is tailored for success in the Marine Corps. This approach maintains a focus on support of warfighting capability, engages key leaders to drive the effort, and ensures tangible and quantifiable improvements and results. All proposed USMC CPI projects will be targeted to:

- Improve the processes that support combat readiness and warfighting capability.
- Address the strategic priorities of the organization.
- Address support priorities validated by the customer (warfighter).
- Have the full support of key leaders and commanders prior to project commencement, including an advance commitment to implement/sustain the gains.
- Target processes with significant potential for improved performance and/or affordability with improved performance as the primary objective.

These project selection criteria will ensure projects produce tangible and quantifiable benefits, address customer priorities, and maximize the odds of success. Commanders, key leaders, and managers will screen all proposed process improvement projects to ensure they meet CPI project criteria and the priorities of the warfighting organizations they support.

USMC CPI also utilizes a structured CPI project management methodology (DMAIC), detailed project charters, risk mitigation plans, and a project management approach that provides rigorous structure to ensure success. This rigorous approach to project management also requires an advance commitment from key leaders to fully support each project and to implement and sustain the gains. Project success metrics and scorecards are used to monitor, manage, and sustain the performance gains produced by each project. Transition Plans will be prepared as a part of each project to support and ensure seamless transition to the optimum performance level in each improved process.

#### 6. Which business improvement tools will be used in Marine Corps CPI?

**Answer:** The Marine Corps CPI approach utilizes recognized best practices and tools including the following:

- **Strategic Planning** is the process by which the leaders of an organization envision its future and identify the high-level actions to be taken over the timeline of the plan to make the vision a reality. The purpose of the strategic plan is to portray a comprehensive, integrated roadmap for an organization that supports its goals for completing its mission and ensuring its future viability.
- **Lean Six Sigma** combines the strategies of Lean (eliminate non-value added activities and improve cycle time) and Six Sigma (reduce process variation and ensure consistent quality).



- **Activity-Based Cost Management** provides critical resource allocation information about support processes and activities in a manner not possible with standard Government accounting systems.
- **Theory of Constraints** provides a set of analytical tools and concepts for analyzing and improving complex interrelated processes and systems to improve overall system functioning and capability. TOC is helpful when addressing the complex extended business enterprise in the Marine Corps.
- **Balanced Resource Management.** The key elements of balanced resource management are accurately identifying and articulating budget and manpower requirements; effective budget execution and alignment of resources to strategic priorities; and process improvement (since waste can consume up to 75% of the typical business process).
- **Extended Enterprise Management** recognizes the network of entities required to effectively deliver products and services and create value for customers. Extended Enterprise Management extends process analysis, improvement, and management to all the organizational components of the larger organization as well as the outside entities that contribute to consistently delivering quality products and services in a timely manner.
- **Integrated Performance Management (IPM)** is an approach/tool that supports the implementation of Extended Enterprise Management and the organization's Strategic Plan. IPM links organizational goals and objectives between the levels and across the processes of an organization and provides a balanced set of strategically aligned measures.

#### 7. Does the Six Sigma concept of "3.4 defects per million" have any relevance in the support processes within the Marine Corps?

**Answer:** This nearly perfect "Six Sigma" defect rate symbolizes the highly efficient process performance that is attainable through continuous process improvement. However, the cost and effort associated with achieving a quality standard of 3.4 defects per million is not feasible in every environment or situation. In our current environment of budget austerity, we must consider and balance both customer requirements and cost to determine the acceptable level of process performance and affordability.

A complimentary approach to setting targets for process performance is outlined in the book, *Demystifying Six Sigma*, in which the author, Alan Larson, states that the standard Six Sigma "rate of improvement goal" is a ten-fold improvement every two years. For example, if 50 out of 100 documents (such as travel orders, contract documents, work requests, etc.) require some type of correction or rework, your target should be to improve to 5 errors per 100 documents within two years. This approach not only assists in establishing realistic targets, but also helps everyone understand the timeline for meeting the target goal.

#### 8. What support is available to implement CPI?

**Answer:** HQMC will provide general implementation and training support for initial establishment of CPI. It is anticipated that over time, all organizations will develop organic capability to support continuous process improvement in their operations.

CPI Support Teams composed of business process improvement specialists (CPI Master Black Belts and Black Belts) are positioned in key locations to provide consulting, coaching, and training support. The CPI Support Teams are under the cognizance of the Director, MCBE Office. These teams will provide general support to commanders, managers, and teams of functional personnel as they conduct process improvement studies and apply CPI tools.

The CPI Support Teams will provide a wide array of general support from project leadership and execution through advice and mentoring, and will function as the most respected resource for CPI excellence. Project Sponsors are encouraged to contact the CPI team as soon as possible as they implement their CPI efforts. The CPI team can provide planning materials, guidance, tools, templates, infrastructure, and the project support needed to get CPI initiatives off to a fast start. Further, by working with the CPI Support Teams, Project Sponsors ensure their projects use a methodology proven effective in the USMC.



In addition to the general consulting and training support provided by the CPI Support Teams, a CPI portal will provide access to a full array of information and a set of project support tools and templates to assist in the successful conduct of process improvement projects.

**9. Who keeps any resource savings resulting from CPI projects?**

**Answer:** The primary focus of the Marine Corps CPI is improving support of MAGTF capability and readiness. The CPI Program will simply be used to meet existing financial pressure while maintaining high-quality support to the warfighter. The MROC, in MROC DM 06-2007, established the policy that generating organizations can retain any cost benefits from CPI projects.

**10. How is the concept of security related to Lean Six Sigma?**

**Answer:** There have been many advances in the fields of security management and Lean Six Sigma. The Lean Six Sigma methodology can be used to improve the security of key processes in addition to improving process performance. In particular, Lean Six Sigma and CPI can be used to improve security risks identified by security personnel.

**11. Where can I get more information?**

**Answer:** For more information contact the Marine Corps Business Enterprise Office at 703-695-5768 or DSN 225-5768.



*United States Marine Corps*  
**Continuous Process Improvement  
Guidebook**

**APPENDIX E**  
**CPI Risk Mitigation Plan**

December 21, 2007



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**

**APPENDIX E**  
**CPI RISK MITIGATION PLAN**

DECEMBER 2007



**Risk Mitigation**

Creating change within established organizations and cultures is a significant undertaking. Add the critical requirement for cross-organizational cooperation in process improvement projects that span and cause change in several organizations, and the challenge is compounded. A well-defined risk mitigation strategy to reduce resistance to change and foster cooperation is essential. The following provides program-level risk mitigation actions to address this important issue.

<b>Risk</b>	<b>Mitigation</b>
<b>HICVS and key stakeholder organizations fail to initiate process improvement studies</b>	<ul style="list-style-type: none"> <li>• Issue MROC guidance if performance below expectation</li> <li>• Issue USMC CPI policy to clarify responsibilities</li> <li>• Work with key leaders individually to tailor an approach</li> <li>• Assist process owner leaders with project proposals</li> </ul>
<b>Personnel in key process owner organizations fail to engage in enterprise-level, cross-organizational process improvement projects</b>	<ul style="list-style-type: none"> <li>• Emphasize use of charter, particularly for cross organizational projects</li> <li>• Assist leaders identify issues and effectively communicate expectations of cross-organizational results</li> </ul>
<b>CPI projects are conducted but produce insignificant results</b>	<ul style="list-style-type: none"> <li>• Follow steps of USMC Project Development Process</li> <li>• Obtain advance commitment of key leaders in the project charter to support implementation and sustain gains</li> <li>• Use a project charter to identify/confirm potential results prior to commencing project</li> <li>• Cancel projects not on track to produce worthwhile results</li> </ul>
<b>Performance gains from CPI projects are not implemented or are not sustained into the future</b>	<ul style="list-style-type: none"> <li>• Effectively educate workforce and implement SecNav instruction 5220.13 on validating CPI benefits</li> <li>• Obtain advance commitment of key leaders in the project charter to support implementation and sustain gains</li> <li>• Develop transition plans as part of the project to guide a seamless transition to the improved process.</li> <li>• Use an organizational scorecard to monitor and manage the process performance</li> <li>• Ensure projects produce control devices like specific procedures and checklists, so baseline performance deviations can be easily identified</li> </ul>
<b>Process improvement efforts and initiatives are not coordinated throughout the enterprise</b>	<ul style="list-style-type: none"> <li>• Leverage cooperative nature of CPI working group to replicate successful projects as appropriate</li> <li>• Request MROC members to assist as appropriate</li> <li>• Use CPI Support teams to ensure consistent approach and methodology across the enterprise and projects are replicated</li> </ul>



*United States Marine Corps*  
**Continuous Process Improvement  
Guidebook**

**APPENDIX E  
CPI Risk Mitigation Plan**

**December 21, 2007**

<b>Risk</b>	<b>Mitigation</b>
<b>Workforce slow pace to embrace process changes</b>	<ul style="list-style-type: none"><li>• Organizational leaders actively sponsor CPI projects</li><li>• Leaders communicate necessity of change to personnel</li><li>• Leaders reinforce that the primary focus of the CPI program is improving support to the warfighter, not cost reduction</li><li>• Include CPI in individual annual performance plans.</li><li>• Use NSPS to align individual performance requirements of managers and employees to process improvement efforts.</li></ul>



*United States Marine Corps  
Continuous Process  
Improvement Guidebook*

**APPENDIX F  
USMC Strategic Planning  
Model**

December 21, 2007

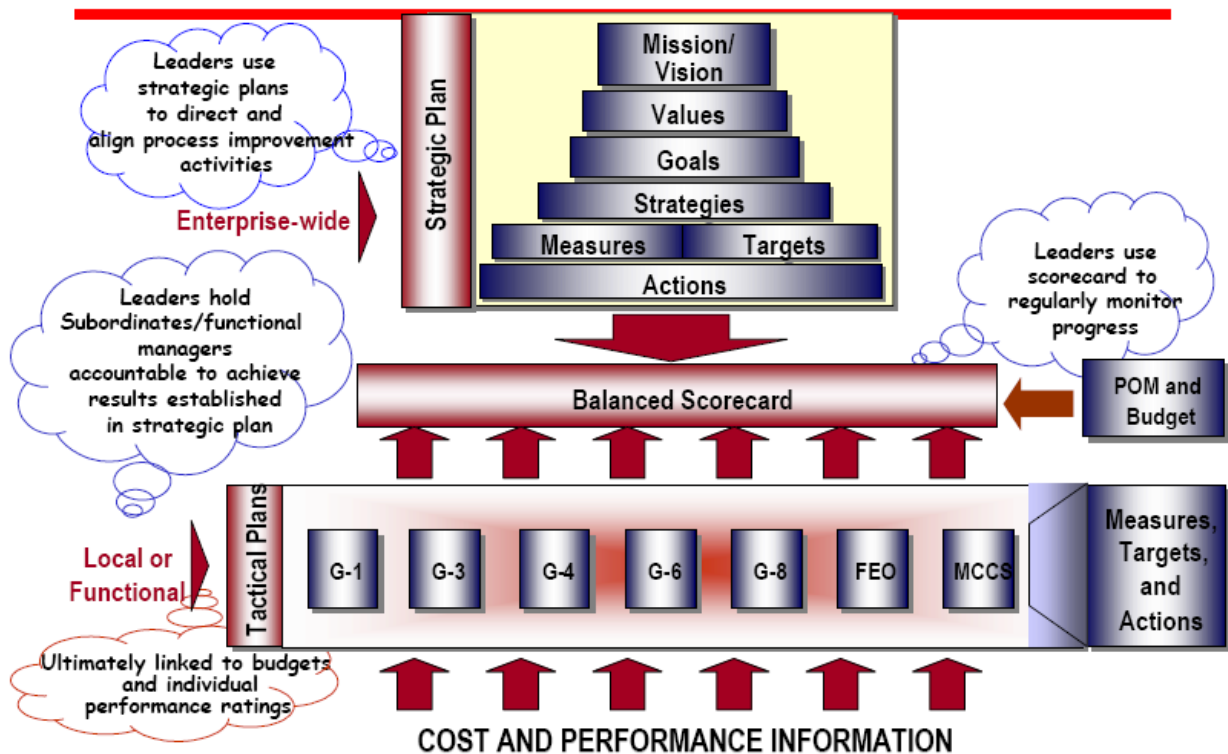


**UNITED STATES MARINE CORPS  
CONTINUOUS PROCESS IMPROVEMENT  
GUIDEBOOK**

**APPENDIX F – USMC STRATEGIC PLANNING MODEL**

DECEMBER 2007

## USMC Strategic Planning Model



**Strategic Planning – The Critical First Step.** Strategic planning is the critical first step in identifying the mission areas in which to focus CPI activities and projects. (See Appendix G, *CPI Project Development Guide*, for detailed information about the role of strategic planning in CPI. The strategic planning step is preferably accomplished with development of a formal, comprehensive strategic plan that identifies all the strategic priorities of the organization and includes implementation strategies and actions for each.

Following are definitions of the recommended components of strategic plans developed for organizations in the Marine Corps Business Enterprise that provide support to war fighting organizations. Also included are definitions of related strategic planning terminology.

- **Mission.** A concise, unambiguous, and enduring statement of purpose and description of the organization's role in the overall objectives of the Marine Corps.
- **Vision.** A clear description of the enhanced future state desired for the organization. The vision statement is a definition of success.
- **Guiding Principles.** A listing of the core values of an organization.
- **Strategic.** Of great importance to mission accomplishment, achieving the strategic vision, and to assuring the long-term viability of the mission capability of the organization.
- **Strategic Themes.** Overarching, fundamental, strategic core outcomes that are central to the mission.



- **Strategic Goal.** A statement of a strategic result to be achieved in the long term and representing a major accomplishment. Strategic goals align with and support accomplishment of the strategic themes.
- **Strategies.** A major course of action an organization will pursue to implement a strategic goal.
- **Objectives.** Important individual actions and/or outcomes that support accomplishment of strategic goals.
- **Measure.** An indicator, taken over a period of time that provides vital information about the status of a process or activity. Measures portrayed on a strategic plan scorecard should drive appropriate leadership or management action.
- **Targets.** Numerical goals, often used on a strategic plan scorecard for driving implementation of the strategic plan.
- **Initiatives.** Specific actions or projects used to accomplish strategic objectives. Each objective may have one or more initiatives associated with it.
- **Balanced Scorecard.** A strategic management tool used to drive implementation of the Strategic Plan as well as performance and accountability throughout an organization. The Balanced Scorecard uses four key dimensions to translate strategy into operational terms. These four dimensions are the fundamental cause and effect factors in strategic management:
  - Customers
  - Operational (process) Excellence
  - Financial
  - Workforce Growth and Learning



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**

**APPENDIX G**  
**CPI PROJECT DEVELOPMENT GUIDE**

DECEMBER 2007

## CPI Project Development Guide

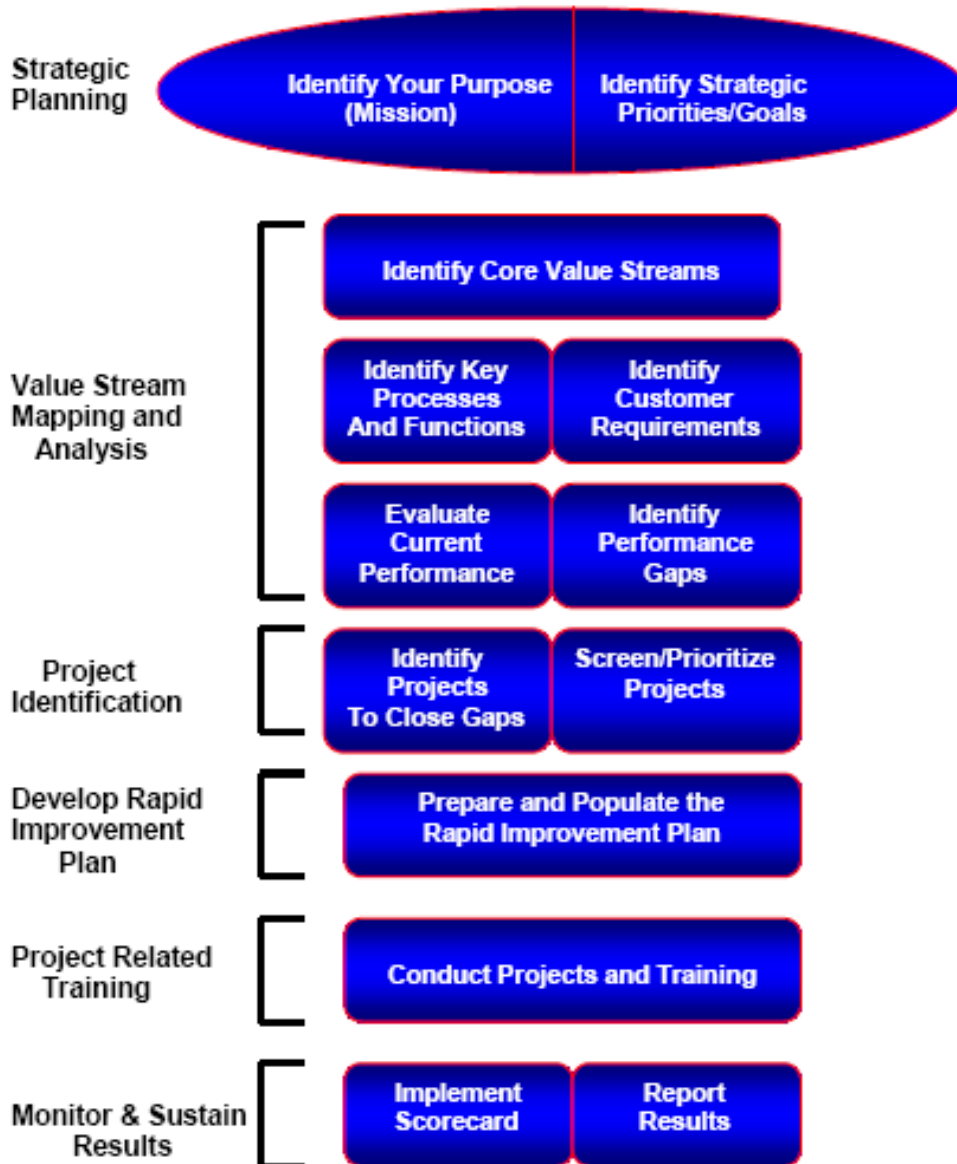
**Introduction.** The Marine Corps employs a top-down CPI project development process that begins with identification of strategic priorities by top leaders. Value stream analysis then identifies high impact project opportunities that directly support the strategic priorities and meet customer requirements. A Rapid Improvement Plan is developed to implement the high impact projects and scorecards are used to monitor, manage, and sustain the process performance gains. Project results are reported via the chain of command to the MROC and CMC/SecNav.

### USMC CPI Project Development Process



**Scorecards Are Used By Leaders and Managers to Monitor and Sustain Process Performance Gains  
 Results are Reported Via the Chain of Command**

### Detailed Steps of the CPI Project Development Process



Each of the major steps of the CPI Project Development process include detailed steps, which are summarized on the following pages. This structured, top-down approach to project selection ensures strategic alignment of CPI efforts throughout the entire organization, selection of high-impact projects, and sustainment of process performance gains into the future. This project development process can be used at any level of an organization to identify strategically aligned, high impact CPI projects.

Strategic  
 Planning



The critical first step of CPI project development is strategic planning, which identifies and defines the strategic mission priorities that are critical to effective warfighting support. All CPI activity is then aligned on the strategic priorities. Strategic planning directly involves, and is the responsibility of, organizational leaders. Leadership support is a key factor in successful CPI projects and leadership support begins with strategic planning. All strategic plans should be aligned with the strategic guidance of higher headquarters and use a scorecard to monitor progress and drive implementation. Appendix F provides information about the USMC Strategic Business Planning model, key components of an effective strategic plan, and strategic planning terminology. In the absence of a formal strategic plan, a fast-track executive planning session can be used to rapidly identify the strategic priorities for the application of CPI. (Contact the CPI Support Teams for assistance in strategic planning and associated project development support).

**All CPI activity is aligned on the strategic priorities.**

Value Stream  
 Mapping and  
 Analysis



**Identify Core Value Streams and Key Processes.** In these important steps of the project development process, the core value streams and their underlying key processes (products and services) that directly support implementation of each strategic goal are identified and analyzed.

**Identify Customer Requirements.** In CPI, all support operations are viewed in the context of customer expectations and requirements, and the customer (supported organizations and personnel) defines value. This involves the leaders and staffs of supporting organizations communicating with supported commanders and personnel to identify their support requirements, priorities, and expectations for those value streams and processes identified in the previous step.

**Evaluate Current Performance and Identify Performance Gaps.** Using specific performance metrics, this step compares the current performance of the key support processes/functions in each value stream to customer requirements. The resulting performance gaps are then addressed with CPI projects.



**Project  
Identification**

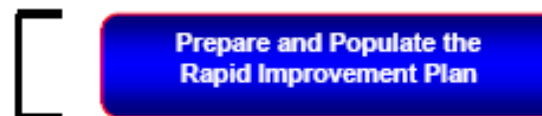


**Identify Projects to Close Gaps.** In this step high-impact, strategically aligned CPI projects are identified to address the customer requirements and performance gaps identified in the previous steps. The process performance metrics used to identify the performance gaps are also used as the project success metrics to ensure customer requirements are specifically addressed by each project. The primary process performance measures used in Marine Corps CPI projects are:

- Process speed (cycle or lead-time)
- Process quality (process reliability and consistent performance)
- Safety and Improved work life
- Affordability
- Customer satisfaction

**Screen/Prioritize Projects.** During this step, all project candidates are evaluated with the CPI Project Assessment Form (Appendix G-2). The Project Assessment Form evaluates/scores projects for strategic importance, importance to the customer, leadership support, project impact, and project supportability/feasibility. This step ensures all project candidates will produce tangible and quantifiable benefits and meet the basic requirements for the expenditure of project support and training resources. It also ensures each project has the strength factors required for successful completion.

**Develop Rapid  
Improvement  
Plan**



The Rapid Improvement Plan (RIP) is prepared at the conclusion of the Value Stream Analysis and provides information about the projects identified during the analysis. See Appendix G-3, *Sample Rapid Improvement Plan Format*. Commanders and managers with authority to implement the organizational changes resulting from CPI projects act as Champions/Project Sponsors responsible for prioritization and execution of the projects in the Rapid Improvement Plan, which include the following projects/events:

- **Just-Do-Its**
  - Champions Execute in 30-45 days or less
- **Rapid Improvement Events**
  - Typically, 6-7 week cycle (3 weeks prep, 1 week activity, 3 weeks follow up)
  - Total hands-on team work = approx. 6 people x 4-5 days
  - Several teams of SMEs may be doing RIEs simultaneously
  - SME Team Leader with Green Belt support
  - The process is transformed during the event
- **Projects**
  - Involves complex processes/problems and uses the DMAIC process
  - 3-5 months duration (Hands-on team work = several hours each week)
  - SME Team Leader and members provide tollgate progress reports to the Champion
  - Black Belt support

Project Related  
 Training



**Conduct Projects and Training**

Marine Corps CP utilizes the DMAIC project management methodology to support successful projects.

## Standard Improvement Methodology: DMAIC



**Project Timeframes.** The maximum cycle time for Green Belt projects is three months and five months for Black Belt projects. The official project start date for project status tracking is the date of the signed project charter. Champions and Project Sponsors will monitor and report the progress of all CPI projects in accordance with established reporting requirements by conducting tollgate review meetings with the project team. See the *USMC CPI Rules of Engagement* below for more information about project management and training.

MROC Decision Memorandum 06-2007 directed that training resources expended in the CPI Program produce tangible results. HQMC provides funded Green Belt training courses, which must be conducted in association with chartered high-impact CPI projects. In addition, a two-day USMC Senior Leader/Project Sponsor course is presented to key leaders and managers to prepare them to effectively manage CPI projects. Generally, the Green Belt project team training and Senior Leader/Project Sponsor courses are presented in conjunction to directly support the implementation of an organizational Rapid Improvement Plan. The appropriate HQMC regional CPI Support Team, who also provides follow-on project completion support, coordinates CPI Training.



**Implement Scorecard.** During the project chartering process, Champions and Project Sponsors agree to establish and use organizational scorecards to monitor, manage and sustain the improved process performance. Experience has shown that continuous monitoring of process performance with scorecards is essential to maintaining the improved process performance over time.

**Reporting Results.** Project results are reported as required via the chain of command to CMC and SecNav. See *USMC CPI Rules of Engagement* below for more information about project reporting.

### Rules of Engagement for USMC CPI Projects

1. MROC Decision Memorandum 06-2007 dated 20 Nov 2006 directed that all resources expended in the CPI Program produce tangible results that improve warfighting readiness. Therefore, all Black Belt and Green Belt training must be conducted in association with chartered CPI projects.
2. There are several primary sources for CPI projects:
  - Projects that address a strategic priority in an existing strategic plan.
  - Projects resulting from mapping and analysis of high impact core value streams.
  - Projects that address priorities established by commanders/leaders.
  - Project ideas/candidates developed by individuals or organizational sub-units.
3. Champions and Project Sponsors have a key role in CPI projects including:
  - Identifying and defining projects.
  - Writing project charters.
  - Identifying success metrics.
  - Selecting project team members.
  - Supporting projects with resources.
  - Monitoring and reporting project progress.
  - Supporting project implementation and ensuring gains are sustained in the future.
4. All CPI projects will be documented on the USMC CPI Charter form. Organizational commanders/managers with the authority to implement the organizational changes resulting from a CPI project have the approval authority for those proposed projects and will sign the project charter.
5. All project charters will be accompanied by and evaluated with the CPI Project Assessment Form. The Project Assessment Form evaluates/scores projects for strategic importance, importance to the warfighter, leadership support, project impact, and project supportability/feasibility.
6. In the event there are more CPI project candidates than resources available to complete them simultaneously, this project assessment process can be used to help prioritize and queue CPI project candidates for project support and training resources. Champions and Project Sponsors should seek to structure their proposed projects to obtain the highest score possible with the Project Assessment Guide



since high project assessment scores will dramatically increase the chances of long-term project success by integrating strengthening factors that reduce project risk.

**7.** HQMC will provide funded Black Belt and Green Belt training in direct support of CPI projects. This training will be results-oriented and must be conducted in conjunction with the completion of chartered high-impact CPI projects.

**8.** All attendees at HQMC-funded Black Belt and Green Belt training courses must present, in advance of the training course, a draft charter that has been approved by the organizational commander or manager with authority to implement the project results. The draft charter(s) represent a commitment from their organization leaders to support, implement, and sustain the results of the project. The commitment from the organizational leader includes an agreement to implement and use a scorecard to monitor and sustain the improved process performance.

**9.** As may be requested by a commander or designated organizational CPI administrator, the HQMC regional CPI Support Teams will assist in the coordination and conduct of all CPI training, in particular Black Belt and Green Belt training courses that are in direct support of CPI projects. All training conducted, coordinated, or sponsored by the HQMC CPI Support Teams (whether internal or external providers) will be tailored to the Marine Corps through the use of USMC-specific examples, case studies and exercises reflective of the Marine Corps environment. Course materials will be updated continually with the most recent and relevant USMC-specific examples.

**10.** The CPI Support Teams will provide coaching and project support before training with assistance in strategic planning, value stream analysis and high-impact project identification, development of project metrics, and preparation of project charters. Support will be provided during and after training with individualized coaching and mentoring, follow-on project completion support, and development and implementation of scorecards to monitor and sustain project results.

**11.** All HQMC-sponsored Black Belt and Green Belt training generally will be conducted in accordance with the following process:

- Organizations identify projects using the USMC CPI Project Development Process.
- Organizations develop a Rapid Improvement Plan (RIP), which includes “Just-Do-Its”, Rapid Improvement Events (RIEs), and full DMAIC projects.
- Organizations identify and align Black Belt and SME Green Belt candidates on the various improvement events in the RIP.
- Organizations respond to training announcements or request training through the chain of command as appropriate.
- CPI Support Teams assist requesting organizations in project and charter development and in coordinating the training courses.
- Training is conducted and competency exam is administered.
- Projects/Events are completed. CPI Support Teams provide follow-on project support if needed.
- Upon successful completion of projects and process improvements, as verified by official scorecard metrics, USMC Black/Green Belt certifications are issued.



**12.** Additional information regarding HQMC-sponsored Green Belt training:

- The minimum number of participants for each Green Belt session is 12 people.
- The maximum number of participants for each Green Belt session is 22 people.
- Project team members are encouraged to attend Green Belt training together.
- Project teams from multiple organizations/locations may attend Green Belt training sessions.
- HQMC will fund instructor fees, instructor travel, and course materials. Green Belt candidates are responsible for travel and per diem expenses.

**13.** Training alone does not suffice for certification as a USMC CPI Black or Green Belt. Certification requires successful completion of a training course that includes the DoN body of knowledge, successful completion of a certification exam, and demonstrated competency through participation in successful CPI projects/RIEs. See Appendix C of the USMC CPI Guidebook for additional information on USMC Green Belt certification requirements.

**14.** Project Timeframes. The official project start date for project status tracking is the date of the signed project charter. The recommended cycle time for Green Belt projects is three months and five months for Black Belt projects.

**15.** Champions and Project Sponsors will monitor and report the progress of all CPI projects in accordance with established reporting requirements by conducting tollgate review meetings with the project team.

**16.** Tollgate review meetings are booked 'hard' two tollgates into the future, on a rolling basis, i.e. at the project start date, the Define and Measure tollgates are 'hard' booked. Once the Define tollgate meeting has taken place, the Analyze tollgate review date becomes 'hard' booked. For GB projects, it is allowable (even encouraged) to combine as many as two tollgate reviews into one meeting.

- "Hard" booked means that the meeting has been setup, i.e. attendees invited, meeting room booked, etc.
- "Soft" booked means that it is in the project plan, but attendees have not yet been confirmed nor has the meeting location been booked.

**17.** The *Define* tollgate review date must be set at 3-4 weeks from project start (Two weeks for a GB project). The Measure, Analyze and Improve tollgate review dates are placed in the schedule based on the best experience of the MBB coach and BB/GBs. The *Control* gate review date should be set at 3-5 months (or earlier) from the start date of the project.

**18.** All tollgate meetings must take place, regardless of team progress. If not ready for a tollgate review, it becomes a status meeting.

**19.** In signing-off on each tollgate review the Project Sponsor has four options:

*Pass* – The team has completed all project deliverables successfully; the Project Sponsor and key stakeholders believe that project success is still achievable and the project goals remain achievable. (Given any scope changes or revised assumptions)

*Proceed With Caution (PWC)* – The team did not complete all required deliverables successfully, but progress can continue on the assumption that the 'gaps' will be closed and success demonstrated at the next tollgate review. A team may proceed only one tollgate without getting a 'Pass' for the prior tollgate. For example, the team can receive a PWC for the Measure phase tollgate and proceed to the Analyze tollgate, but cannot proceed to the Improve tollgate until they have received a 'Pass' for the Measure tollgate.

*Cancel* – It is no longer believed the project can accomplish the goals of the project charter.



*Cannot Proceed* – A severe deficiency in the process or deliverables was noted which prohibit the project from moving forward until the deficiency has been corrected. A custom mitigation plan must be put in place to correct the deficiency before the team can be allowed to move forward with the project to the next tollgate. Approval of the correction of the deficiency is required from the Project Sponsor before the project team is allowed to move ahead to the next tollgate.

**20.** The following applies to reporting the status of the project performance in regard to schedule:

- Any movement of project schedule to the right immediately puts project in Yellow or Red status.
- Any tollgate review date missed is immediately *Yellow*. If the miss is greater than two weeks (one week for GB projects), it moves to *Red*.
- Any movement of the Control gate to the right is immediately moved to *Yellow*. If the miss is greater than four weeks (two weeks for GB projects), it moves to *Red*.
- Movement of the 'soft' booked tollgate reviews is allowed, as long as the Control gate review will still take place on schedule.



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**

**APPENDIX G – 1**

**USMC CPI PROJECT CHARTER FORMS  
& SAMPLES**



*United States Marine Corps*  
**Continuous Process Improvement  
 Guidebook**

**APPENDIX G  
 CPI Project  
 Development Guide**

December 21, 2007

**Charter Template (Page 1 of 2)**



CPI PROJECT/EVENT CHARTER

Project/Event Name: Organization: Project Champion: Project Sponsor: Project Manager:	Date: Type of Event: Project ___ RIE ___ JDI ___																																			
Benefit Case:																																				
Opportunity/Problem Statement																																				
Goal Statement																																				
Project Scope  In Scope  Out of Scope																																				
Project Plan <ul style="list-style-type: none"> <li>• Define</li> <li>• Measure:</li> <li>• Analyze:</li> <li>• Improve:</li> <li>• Control:</li> </ul>																																				
Team Selection <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="width: 20%;">Role</th> <th style="width: 30%;">Name</th> <th style="width: 20%;">Utilization</th> <th style="width: 15%;">Start</th> <th style="width: 15%;">End</th> </tr> </thead> <tbody> <tr> <td>Project Champion</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project Sponsor</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Project Manager</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Black Belt</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Team Member</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Team Member</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Role	Name	Utilization	Start	End	Project Champion					Project Sponsor					Project Manager					Black Belt					Team Member					Team Member				
Role	Name	Utilization	Start	End																																
Project Champion																																				
Project Sponsor																																				
Project Manager																																				
Black Belt																																				
Team Member																																				
Team Member																																				



United States Marine Corps  
**Continuous Process Improvement  
Guidebook**

**APPENDIX G  
CPI Project  
Development Guide**

December 21, 2007

**Charter Template (Page 2 of 2)**



**CPI PROJECT/EVENT CHARTER**

**Project Approvals:**

\_\_\_\_\_  
Project Champion Date

\_\_\_\_\_  
Project Sponsor Date

\_\_\_\_\_  
Project Manager Date

\_\_\_\_\_  
Black Belt Date

**The Project Champion agrees to:**

- Provide sufficient resources to support completion of the project
- Implement and sustain project gains by establishing a scorecard to monitor and manage process performance
- To report project results, as required, to higher headquarters

**The Project Sponsor agrees to:**

- Help provide data and insight on project
- Monitor progress of project through progress (to/ligate) reviews
- Coordinate with required leadership to approve recommendations in a timely manner
- Assist with implementation of recommendations, following approval
- Sustain improvements and financial gains following the project
- Be available to discuss and rectify any project related concerns and remove barriers to success



*United States Marine Corps*  
**Continuous Process Improvement  
 Guidebook**

**APPENDIX G  
 CPI Project  
 Development Guide**

December 21, 2007

**Project Charter Completion Guidance (Page 1 of 2)**



CPI PROJECT/EVENT CHARTER

Project/Event Name: Organization: Project Champion: Project Sponsor: Project Manager:	Date: _____ Type of Event: Project _____ RIE _____ JDI _____															
<hr/>																
<b>Benefit Case</b>																
What tangible benefit would occur from pursuing this project? What is the impact on quality, cycle time, or cost efficiency from this project? Is completion of this project/event in alignment with organizational goals?																
<hr/>																
<b>Opportunity/Problem Statement</b>																
What customer or organizational "pain" is being experienced? What is the nature of the problem in quantifiable terms? Where is the problem occurring? How long has the problem existed? What would happen if this project/event were not pursued?																
<hr/>																
<b>Goal Statement</b>																
Is this a LSS DMAIC or JDI project? What is the main quantifiable goal of the project? Schedule? Quality? Cost Effectiveness? Implement known solution?																
<hr/>																
<b>Project Scope</b>																
<b>In Scope</b>																
What are the beginning and end points of the project process? What major processes are involved/ affected? What organizations are involved/ affected?																
<b>Out of Scope</b>																
What processes are excluded in this project? What organizations are excluded from this project? What other known issues affect this process that will not be addressed during this project/event?																
<hr/>																
<b>Project Plan</b>																
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">• Define</td> <td style="width: 35%;">(BB) Project start + 1 month</td> <td style="width: 35%;">(GB) Project start + 2 weeks</td> </tr> <tr> <td>• Measure:</td> <td>(BB) Project start + 2 months</td> <td></td> </tr> <tr> <td>• Analyze:</td> <td>(BB) Project start + 3 months</td> <td></td> </tr> <tr> <td>• Improve:</td> <td>(BB) Project start + 4 months</td> <td></td> </tr> <tr> <td>• Control:</td> <td>(BB) Project start + 5 months</td> <td>(GB) Project start + 3 months</td> </tr> </table>		• Define	(BB) Project start + 1 month	(GB) Project start + 2 weeks	• Measure:	(BB) Project start + 2 months		• Analyze:	(BB) Project start + 3 months		• Improve:	(BB) Project start + 4 months		• Control:	(BB) Project start + 5 months	(GB) Project start + 3 months
• Define	(BB) Project start + 1 month	(GB) Project start + 2 weeks														
• Measure:	(BB) Project start + 2 months															
• Analyze:	(BB) Project start + 3 months															
• Improve:	(BB) Project start + 4 months															
• Control:	(BB) Project start + 5 months	(GB) Project start + 3 months														
<hr/>																



*United States Marine Corps*  
**Continuous Process Improvement  
 Guidebook**

**Project Charter Completion Guidance (Page 2 of 2)**



**CPI PROJECT/EVENT CHARTER**

**Team Selection**

Role	Name	Utilization	Start	End
Project Champion	Colonel Smith	1%		
Project Sponsor	Linda James	6%		
Project Manager	John Hooper	100%		
Black Belt	Judy Freeman	100%		
Team Member	Nancy Roper	26%		
Team Member	Fred Lacey	26%		
Team Member	Sam Grance	26%		

**Project Approvals:**

Project Champion \_\_\_\_\_ Date \_\_\_\_\_

Project Sponsor \_\_\_\_\_ Date \_\_\_\_\_

Project Manager \_\_\_\_\_ Date \_\_\_\_\_

Black Belt \_\_\_\_\_ Date \_\_\_\_\_

**The Project Champion agrees to:**

- Provide sufficient resources to support completion of the project
- Implement and sustain project gains by establishing a scorecard to monitor and manage process performance
- To report project results, as required, to higher headquarters

**The Project Sponsor agrees to:**

- Help provide data and insight on project
- Monitor progress of project through progress (tollgate) reviews
- Coordinate with required leadership to approve recommendations in a timely manner
- Assist with implementation of recommendations, following approval
- Sustain improvements and financial gains following the project
- Be available to discuss and rectify any project related concerns and remove barriers to success



*United States Marine Corps*  
**Continuous Process Improvement  
 Guidebook**

**APPENDIX G  
 CPI Project  
 Development Guide**

December 21, 2007

**Project Charter Sample (Page 1 of 2)**



CPI PROJECT/EVENT CHARTER

<b>Project/Event Name:</b>	Civilian HR Sourcing	<b>Date:</b>	
<b>Organization:</b>	Marine Corps Base XYX	<b>Type of Event:</b>	Project <u>  X  </u>
<b>Project Champion:</b>	CO MCB XYZ		RIE <u>      </u>
<b>Project Sponsor:</b>	Director, Manpower, MCB XYZ		JDI <u>      </u>
<b>Project Manager:</b>	MCB XYZ Business Performance Officer		

**Benefit Case:**

Reducing civilian hiring time to 30 days with a 98% certainty level is expected to yield the following tangible benefits:

- Free up \_\_\_ labor hours currently consumed in the civilian HR hiring process equating to a Type II labor savings of \$\_\_\_\_\_.
- Reduce presented candidate rejection rates from 50% to 5%

In addition, this project is expected to yield the following intangible benefits to the USMC organization:

- Improved support to the warfighter due to more timely civilian support
- Less stress and overload on existing civilian employees

**Opportunity/Problem Statement**

Civilian employees provide essential continuity of operations in warfighter support functions and military-civilian conversions are increasing the percentage of civilians in these functions. As these mission-essential support functions are streamlined and reach MEO, the need to rapidly fill civilian vacancies becomes critical. Also, installation security functions are being civilianized and maintaining full staffing of these key positions is critical to force protection.

The current performance of the civilian HR hiring process is consistently identified by managers in support organizations as failing to meet current mission requirements and as having a serious negative impact on their capability to provide effective support to warfighter organizations. The primary problem identified by all managers is excessive cycle time in the hiring process, which also causes an excessive position vacancy rate. The current range of cycle time for this process at NCR organizations is xx – xx days for Internal Recruitment actions, xx – xx days for External Recruitment actions, and an average position vacancy rate of xx%.

**Goal Statement**

Reduce the average cycle time of the civilian HR hiring process from 6 to 9 months to a standard acceptable level of 30 days that meets the requirements of Marine Corps organizations. Candidates must continue to be of high quality as defined by all applicable personnel regulations.

Data for the following key metrics are available now in the DoN HR Modern System:

- Average Cycle Time to Fill a Job Vacancy (Internal Recruitment)
- Average Cycle Time to Fill a Job Vacancy (External Recruitment)
- Average Position Vacancy Rate

**Project Scope**

**In Scope**

- Civilian HR Hiring Process beginning with the RPA entered in the Modern System and ending with issuance of Certificate of Eligibles (or ending with selection and return of the Certificate by supported organization?).
- Coordination with the DoNHRSCs on process performance issues and process performance data.

**Out of Scope**

- Legal issues and process issues not directly affecting cycle time or vacancy rates.



*United States Marine Corps*  
**Continuous Process Improvement  
 Guidebook**

**Project Charter Sample (Page 2 of 2)**



CPI PROJECT/EVENT CHARTER

<b>Project Plan</b> <ul style="list-style-type: none"> <li>• Define: Dec 06</li> <li>• Measure: Jan 07</li> <li>• Analyze: Feb 07</li> <li>• Improve: Mar 07</li> <li>• Control: Apr 07</li> </ul>																																												
<b>Team Selection</b> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">Role</th> <th style="text-align: left;">Name</th> <th style="text-align: left;">Utilization</th> <th style="text-align: left;">Start</th> <th style="text-align: left;">End</th> </tr> </thead> <tbody> <tr> <td>Project Champion</td> <td>Colonel Smith</td> <td>1%</td> <td></td> <td></td> </tr> <tr> <td>Project Sponsor</td> <td>Linda James</td> <td>6%</td> <td></td> <td></td> </tr> <tr> <td>Project Manager</td> <td>John Hooper</td> <td>100%</td> <td></td> <td></td> </tr> <tr> <td>Black Belt</td> <td>Judy Freeman</td> <td>100%</td> <td></td> <td></td> </tr> <tr> <td>Team Member</td> <td>Nanoy Roper</td> <td>26%</td> <td></td> <td></td> </tr> <tr> <td>Team Member</td> <td>Fred Laoye</td> <td>26%</td> <td></td> <td></td> </tr> <tr> <td>Team Member</td> <td>Sam Grange</td> <td>26%</td> <td></td> <td></td> </tr> </tbody> </table>					Role	Name	Utilization	Start	End	Project Champion	Colonel Smith	1%			Project Sponsor	Linda James	6%			Project Manager	John Hooper	100%			Black Belt	Judy Freeman	100%			Team Member	Nanoy Roper	26%			Team Member	Fred Laoye	26%			Team Member	Sam Grange	26%		
Role	Name	Utilization	Start	End																																								
Project Champion	Colonel Smith	1%																																										
Project Sponsor	Linda James	6%																																										
Project Manager	John Hooper	100%																																										
Black Belt	Judy Freeman	100%																																										
Team Member	Nanoy Roper	26%																																										
Team Member	Fred Laoye	26%																																										
Team Member	Sam Grange	26%																																										
<b>Project Approvals:</b>																																												
Project Champion		Date																																										
Project Sponsor		Date																																										
Project Manager		Date																																										
Black Belt		Date																																										
<b>The Project Champion agrees to:</b> <ul style="list-style-type: none"> <li>• Provide sufficient resources to support completion of the project</li> <li>• Implement and sustain project gains by establishing a scorecard to monitor and manage process performance</li> <li>• To report project results, as required, to higher headquarters</li> </ul>																																												
<b>The Project Sponsor agrees to:</b> <ul style="list-style-type: none"> <li>• Help provide data and insight on project</li> <li>• Monitor progress of project through progress (tollgate) reviews</li> <li>• Coordinate with required leadership to approve recommendations in a timely manner</li> <li>• Assist with implementation of recommendations, following approval</li> <li>• Sustain improvements and financial gains following the project</li> <li>• Be available to discuss and rectify any project related concerns and remove barriers to success</li> </ul>																																												



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**  
  
**APPENDIX H**  
  
**REFERENCES**

**DECEMBER 2007**



## References

- (A). Marine Corps Business Enterprise Strategic Plan dated 3 Nov 2004.** This document defines the Marine Corps Business Enterprise as all the resources, processes, products, and services that combine to support the warfighter and outlines strategies and actions to continuously improve the capability and affordability of that support.
- (B). DepSecDef Memorandum, Establishment of DoD-wide Continuous Process Improvement Programs, dated 11 May 2006.** This memorandum provides guidance for the establishment of CPI programs throughout the DoD and promulgates the DoD CIP Guidebook. It also establishes the DoD policy that all cost savings and expense reductions resulting from CPI efforts can be retained by the organizations that generate them.
- (C). Department of Defense Continuous Process Improvement Transformation Guidebook dated May 11, 2006.** This guidebook provides detailed information and guidance regarding the establishment of effective CPI programs in DoD organizations.
- (D). SecNav Memorandum, Transformation Through Lean Six Sigma, dated 3 May 2006.** This memorandum establishes a DoN-wide effort to employ process improvement and Lean Six Sigma to create more readiness and assets throughout the Department of the Navy. The DoN initiative is focused on organizational entities involved in transactional services and support missions.
- (E). Department of the Navy Lean Six Sigma Three Year Action Plan dated 28 Jun 2006.** The Department of the Navy Lean Six Sigma Three Year Action Plan establishes specific goals and targets to enhance the performance and affordability of the processes that support warfighting. It documents specific goals and targets for enhancing the high impact core processes, providing training and education in process improvement tools, and outlines the leadership actions required to support the overall effort.
- (F). MROC Decision Memorandum DM 06-2007 dated 20 Nov 2006.** Established MROC oversight of CPI in the Marine Corps and MROC review of monthly CPI progress reports required by the SecNav. Established policy that USMC organizations may retain the benefits they generate with CPI.
- (G). CMC Message 141654Z DEC 06, Improving Combat Readiness Through Innovation.** This message establishes Marine Corps Continuous Process Improvement and assigns key roles and responsibilities to the leaders of organizations that provide support to warfighting.
- (H). MROC Decision Memorandum DM 32-2007 dated 10 Apr 2007.** Approved the application of CPI in the nine major High Impact Core Value Streams (HICVS) that provide integrated support to Marine Corps war fighting capability.
- (I). DepSecDef Memorandum, DoD-wide Continuous Process Improvement (CPI)/ Lean Six Sigma (LSS) dated 30 April 2007.** This memorandum establishes a DoD Program Office for CPI/LSS and provides guidance for the establishment of CPI programs throughout the DoD. It directs several DoD-wide actions including establishment of CPI/LSS POCs in DoD organizations, training objectives of 1% of the workforce as Black Belts and 5% as Green Belts, CPI/LSS in all employee performance objectives, and DoD-wide reporting of results every 30 days.
- (J). Marine Corps Doctrinal Publication MCDP 5, *Planning*.**
- (K). MCWP 6-11, *Leading Marines* (formally designated as FMFM1-0).**
- (L). SecNav memo dtd 9 Oct 2007, Department of Navy Objectives for 2008 and Beyond.** Directs CMC/ to accelerate integration of LSS across the DoN to develop a culture of continuous Improvement.
- (M). SECNAVINST 5220.13 dtd 30 Nov 2007, Validating and Leveraging Financial Benefits Associated with Lean Six Sigma for Continuous Process Improvement.** Codifies the process for validating and leveraging financial benefits associated with LSS and CPI.

Questions or comments on the Marine Corps CPI Guidebook can be directed to the Marine Corps Business Enterprise Office at 703-695-5768, DSN 225-5768



**UNITED STATES MARINE CORPS**  
**CONTINUOUS PROCESS IMPROVEMENT**  
**GUIDEBOOK**

**APPENDIX I**

**CPI WORKING GROUP MEMBERS**

**DECEMBER 2007**



### CPI Working Group Members

<u>Name</u>	<u>Organization</u>	<u>HICVS</u>
<b><u>9 HICVS Champions</u></b>		
Bentley CIV Clyde F.	CG, MCSC	Acquisition
Brassard GS14 Ronald R. and Layer CIV Vickie M.	DC, I&L (LP) (LOGCOM)	TLCM TLCM
Craft SES Jim P; and Hill GS15 Janice L. and Zich, Col Ronald M.	Director, C4 Director, C4 Director, C4	IT IT IT
Genteman GS14 Alan J.	DC, I&L (LFS)	Facility Management
Hohman LtCol Robert J. and Rosewarne GS15 John R. and TBD	DC, CD (MCB NCR) (TECOM)	EFDS/Capability Development
Kenkel GS14 James D. and LtCol Wynn Cedic E.	DC, M&RA DC, M&RA	Human Resources Human Resources
Perez Maj Elizabeth D. Garant, Col Pierre	DC, AVN DC, AVN	Aviation MLCM/AirSpeed Aviation MLCM/AirSpeed
TBD	DC, P&R	Financial Resources
Keating, Col Pete	DC, PP&O	Service/MarFor Advocacy

#### **4 Key Stakeholder Champions**

MarFors		
Stalnaker, Col;	MARFORPAC	MARFOR
Day Col James A.	MARFORCOM	MARFOR
and Prather GS12 Hope S.	MARFORCOM	MARFOR
Jagusch Col Thomas D.	MARFORRES	MARFOR
and McGuinness GS-14 Robert	MARFORRES	MARFOR
MCRC		
Fernandez CIV Judy D.	MCRD SD	MCRC
Quincy GS14 Lora	MCRD PI	MCRC

#### **Other Stakeholders**

Dawson GS14 Thomas G.                      HQMC/AR

#### **CPI WORKING GROUP FY 08 OBJECTIVES**

1. Coordinate development of appropriate CPI policy.
2. Coordinate deployment of CPIMS.
3. Enable completion of successful CPI projects.
4. Coordinate development of CPI training goals.