CITI QC Foundation

Quality Management Processes

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1. Quality Control Plan (QCP)

The Quality Control Plan (QCP) identifies the processes and procedures in place at Creative Information Technology, Inc. (CITI) to deliver quality products and services. This QCP provides information on how key Quality Control (QC) process components will be integrated with the CMMI Methodology and PMBOK-driven PMO to promote zero defects and error-free services. Quality Control is the process for providing adequate assurance that both the deliverables and processes in the project life cycle conform to specified requirements and adhere to established plans. The QCP is intended to verify that all services and deliverables submitted by our Team conform to the customer's performance requirements and standards.

Our goals for quality are to produce ***defect free*** products or ***zero deficiencies*** in services and in order to achieve this; we have an elaborate, well defined, documented and executed Quality Management Plan and organization structure. The unique part of our quality management plan is what we do when we discover a defect or deficiency. Our quality control processes, inspection methods, peer review processes and escalation procedures are all geared to avoid defects, but our statistical work processes, defect tracking and analysis processes work to make sure all defects or deficiencies are taken seriously and issues are communicated to the highest level of the organization.

The purpose of the Quality Control document is to institutionalize the improvement process and implement ongoing control processes; to sustain gains that are achieved over a period of time; to confirm that the benefits have been realized and to make the transformation permanent. Any control process has to answer questions such as "Did the actions successfully accomplish the project objectives; is the process stable and in control; are plans in place to assure that control will be maintained, and where else can the controls be applied to benefit the project?" Key elements of the processes are the quality program and government identified Performance Objectives, Service Level Agreements and dictates the minimum inspection requirement to be accomplished. This QCP provides the procedures on how to conduct these evaluations.

To facilitate control of the quality programs, our quality assurance personnel and Government Performance Monitors (GPM) work together to verify compliance using designated QASP, SLA, and Award Fee (if relevant) Evaluation Criteria.

This plan identifies the methods and procedures CITI uses to effectively define, measure, analyze, improve, and control quality as identified in the Statement of Work (SOW) and approved Service Level Agreement and Quality Assurance Surveillance Plan (QASP). This plan ensures that systematic quality assurance methods in compliance with CITI's Level 3 assessed processes are used in the administration of Performance-Based Service Contract (PBSC) standards and in subsequent task orders that may be issued.

Authority

This document has been reviewed by the Engineering Process Group (EPG) and approved by the Quality Management Board (QMB) of CITI.

Scope

To fully understand the roles and the responsibilities of the parties, it is important to first define the distinction in terminology between the Quality Control Plan (QCP) and the Quality Assurance Surveillance Plan (QASP). CITI is responsible for management and quality control actions necessary to meet the quality standards set forth by the customer. CITI develops and submits a Quality Control Plan (QCP) for Government approval in compliance with the contract deliverables. Once accepted, the QCP becomes the guide which is followed by the staff in performance of the work. Further, it calls for rigorously documenting the implementation of the required management and quality control actions to achieve the specified results. On the other hand, the QASP facilitates Government surveillance oversight of CITI's quality control efforts to ensure that they are timely, effective, and compliant.

The QCP will provide a description of the tasks, activities, review cycles, procedures, and tools used to deliver the highest quality products and meet the standards of performance expected by the Government.

Applicability

This Contract Level QCP document will be used to implement control processes, monitoring methods and measurement and analysis activities throughout the contract and the associated task orders. The Task Order QCP which provides further details and relates the SOW, SLA, and QASP in one control sheet will be used at the Task Order level to control and manage tasks at consistently high level of quality.

This document will be included in every Subcontracting Agreement and Subcontract Task Order Statements and will be enforced across all tasks whether we have an integrated large team with multiple subcontractors or a small and short task that is completely outsourced to one subcontractor.

1.1 QC Foundation: Quality Management Processes

Quality Control environment at CITI is a critical function within our Quality Management processes that have been put in place to maximize quality in every facet and at every stage of our work, and to avoid defects and deficiencies from appearing as issues to be resolved.

When we refer to our "project process" or "development process", we mean the entire aggregate of many individual processes that we have enacted to produce quality work for our customers. We are independently assessed at Capability Maturity Model® Integration (CMMI) Level 3.

We maintain and develop artifacts throughout the organization in support of the consistent implementation of these defined, repeatable processes, which are organized into four groups:

- Process Management processes
- Project Management processes
- Engineering processes
- Support processes

1.1.1 Process Management Processes

Our documented Process Management processes were created to lay the foundation for quality planning and management, and for ongoing process improvement:

- With the Program Management process, we established a matrix management system with defined functional areas of responsibility for the ownership of process areas, including the development, performance measurement, and ongoing improvement of each process, as well as the development of a team of functional area specialists.
- The Organizational Training process is used in our divisions to ensure that project personnel are armed with the skills set and knowledgebase required to effectively perform all project work within the defined process framework.
- With the Process Improvement process, we have instituted a mechanism to continuously identify opportunities for process improvement, for implementation of best practices, for sharing of Lessons Learned, and for enhancements to the collection of project tools and experiences collected in the corporate Process Asset Library.
- Project Acquisition process enables the Business Development group to pursue projects that best promote and enhance our capability to meet our customers' needs for a high standard of quality from their contractors.

1.1.2 Project Management Processes

Our documented, well defined and institutionalized Project Management processes were created to systematically and proactively promote an environment that is conducive to producing quality project outputs:

- Project Planning and Oversight process defines our discipline for developing and managing to a project plan that encompasses all aspects of project management best practices, including effort estimations, resource needs, scheduling, proactive risk management, stakeholder communications planning, supplier agreement management, and progress reviews. Inherent in this process is the Project Manager's ongoing and active role in "working the plan":
  - Monitoring and controlling the project against project plans, mitigating risks, determining performance measures, and managing corrective actions to closure.
  - Keeping the customer abreast of project progress, milestones, risks, earned value, and other developments, as appropriate.
  - Validating successive iterations of the product under development against acceptance criteria that are defined based on customer input.
  - Maintaining regular oversight of and close communication with all subcontractors.
- Risk Management is defined as a separate process to ensure a heightened focus on inhibiting the potential negative effects to the projects of possible events, and to maximize the potential positive effects. All employees are responsible for implementing this process throughout each task's period of performance.
- Project Communication process ensures that our projects thoroughly and consistently maintain open lines of communication with customers and all other stakeholders for the timely sharing of project data, including the dissemination of progress reports.
- Supplier Agreement Management process defines our standard method for acquiring goods and services from trusted sources, based on documented criteria and negotiated relationships.

1.1.3 Engineering Processes

Engineering processes are designed to incrementally build quality into each aspect of our project outputs during each project phase:

- With the Scope Management process, we proactively work with our customers to help them define project requirements, then manage the requirements throughout the life of the project, including maintaining a requirements matrix that maps product functionality to specific functional requirements, as well as to test cases. Once the initial approved requirements set is baselined, change requests are addressed and any necessary changes to the requirements set are made in a controlled fashion. Bi-directional traceability is maintained between high-level requirements and lower level requirements, as well as to related product change requests. Scope Management also encompasses advising our customers regarding the intelligent bundling of change requests into product releases to result in economies of scale in development as well as risk mitigation and maximization of opportunities across the product's life cycle.
- Our software projects use the Software Development process to systematically define and implement the best-fit design from the alternative solutions, including any necessary interfaces, based on the set of approved requirements. Individual components are reviewed and are integrated in a controlled fashion.
- The Peer Review process provides a mechanism for identifying and removing work product defects at the earliest stages of development. All project team members participate in the peer

review process, and all internal and external deliverables are objectively reviewed against documented criteria.

- Testing process incorporates verification across each stage of product development, from unit testing on components to complete system testing against documented Test Plans that map to the entire set of approved project requirements. At each stage, defect identification leads to resolution via interaction with the Software Development process, until final system testing demonstrates thorough verification that the delivered product will satisfy all project requirements.

1.1.4 Support Processes

Support processes span across all Project Management and Process Management processes. They collectively enable our team member's ongoing quality control and process improvement efforts:

- Throughout all phases of each project, the Configuration Management process establishes and maintains control of the content and status of identified configuration items, including product components and all items that support projects and product development. Configuration Management also encompasses maintaining the integrity of all product baselines and ensuring that product deliverables are not delivered to the customer until they meet documented release criteria.
- The activities of Measurement and Analysis process area provide the foundation for all quality control and process improvement efforts. Data is collected and analyzed on all project operations to measure performance trends against acceptable thresholds and to proactively correct processes to ensure satisfactory performance and quality objectives.
- Standards Compliance process provides for the regular, objective evaluation of all projects' compliance to project and corporate standards, processes, and procedures, and for the aggressive resolution of any non-compliance issues.
- The Technical Support process defines support of software products, infrastructure and associated services in the field, as well as interaction with Stakeholders in support of systems that are peripheral to developed and supported systems. The Technical Support process also supports our customer's hardware and network issues (LAN/MAN/WAN) across the world.

Our processes maintain an overarching adherence to sound fundamentals and industry best practice activities. They are primarily implemented with basic templates we devised in-house with available MS Office tools. However, the processes are tool-agnostic, and can be followed within any customer-mandated tool environment using any customer-mandated tools. In accordance with our customer's needs, we are currently finding success using selected tools from the IBM Rational suite.

Our focus is on the intelligent application of our mission, policies and procedures to each project, and we tailor our activities accordingly to achieve the best use of our resources.

1.2 Organizational Process Ownership

In preparation for successfully achieving an independent assessment of CMMI Level 3, CITI determined that there was a need to distribute the responsibility for the definition and enactment of process improvements across the entire organization to achieve our higher quality goals.

To accomplish this, CITI established a matrix management system with defined functional areas of responsibility for process ownership, to include the development, performance measurement, and ongoing improvement of each process, as well as the development of a team of functional area specialists. This matrix management system is Program Management Office (PMO.)

1.2.1 Program Management Office

Program Management Office (PMO) organization allows each process to be championed by a process owner who is motivated to ensure that industry best practices are performed at CITI within that process area, without being influenced by the needs of other process areas that may introduce potential conflicts of interest. The PMO also removes the burden of each project having to independently develop process descriptions and artifacts. These items are developed for each functional group, and are distributed across all projects.

The PMO is an organization of CITI employees as a matrix of functional area specialists. Each functional area is managed by a "Functional Manager". The term "Functional" is used to refer to the representation of the matrix style of management, in which projects are shown as horizontal groupings across employees, and functional areas are shown as Functional groupings.

Table 1. Functional Areas of CITI's Program Management Office (PMO)

Functional Area	Project Mgmt.	Scope Mgmt.	Risk Mgmt.	Testing	SW Dev.	Tech Support	DBA Mgmt.	Config. Mgmt.
Functional Manager	PMO Mgr.	SM Mgr.	RM Mgr.	Testing Mgr.	Dev. Mgr.	T.S. Mgr.	DBA Mgr.	CM Mgr.
Project A Practitioners:	Project Manager	Requirements Analyst	Risk Analyst	Test Engineers	Software Engineers	Tech. Supp. Analysts	DBA	Config. Analyst
Project B Practitioners:	Project Manager	Requirements Analyst	Risk Analyst	Test Engineers	Software Engineers	Tech. Supp. Analysts	DBA	Config. Analyst
Project C Practitioners:	Project Manager	Requirements Analyst	Risk Analyst	Test Engineers	Software Engineers	Tech. Supp. Analysts	DBA	Config. Analyst

These Functional groupings benefit both the organization and the employees in the following ways:

- Employees benefit from a consistent process and the breadth of experience of their functional groups across multiple projects.
- Functional Managers (FMs), who are responsible for training in their functional areas, focus on acquiring the skills and expertise within their functional teams to maximize our corporate ability to perform at the highest levels of quality.
- Project Managers (PMs) can focus on delivering on schedule, while others are driving the implementation of best practices within specific functional areas. Also, a Project Manager has the flexibility to get a project schedule back on track by working with the FMs to temporarily add resources.

Our institutionalized processes were developed by their respective FMs, with the full participation of the process practitioners. The FMs are responsible for implementing and improving the processes they "own" by submitting it for review by the Engineering Process Group (EPG) and approval by the Quality Management Board (QMB).

The PMO is also responsible for creating and managing the centralized Lessons Learned repository, which allows projects to review the lessons from past projects to incorporate into project planning, and to add their own lessons as part of the project closeout phase of the Project Planning and Oversight process. This ensures that past mistakes are not duplicated by other projects. It also helps projects in evaluating new efforts, identifying risks, determining viable mitigation strategies, and improving project performance.

1.2.2 Functional Managers' Roles and Responsibilities

FMs operate at a peer level with Project Managers, enabling each manager to form a working relationship with each PM and to ensure that the projects conform to CITI standards. Whereas the Project Manager is focused on the success of the project, FMs are focused on the consistent implementation of best practices via the documented CITI process.

The CITI PMO has established FMs to oversee the following functional areas. This list is expanded as more processes are defined, approved, and institutionalized:

- Risk Management
- Scope Management
- Configuration Management
- Software Development
- Configuration Management
- Database Administration
- Technical Support

Each FM is responsible for contributing to the quality of CITI's work by ensuring that processes are followed for their functional area to provide value-add to each project. The processes are designed to ensure maximum flexibility to account for project variables while still conforming to a single set of core values. Each FM's responsibilities include:

- Overseeing the professional development and utilization of his or her functional team across projects.
- Ensuring that each project team is compliant with CITI processes (For example, the Software Development FM would ensure that each project has a software development plan, software architecture document, and all additional necessary and applicable design documentation, which the project must define in the software development plan).
- Ensuring that projects are complying with any customer-mandated processes and or standards related to his or her area (e.g., the use of Rational ClearCase for configuration management within a CA project).
- Cooperating with the Standards Compliance Manager in monthly process audits, as necessary.
- Ensuring that appropriate Peer Review Checklists (PRCs) exist for all project deliverables, including creating new PRCs or augmenting existing ones, as necessary.
- Participating in defining the process to be followed, as well as the measures and thresholds that are to be used to demonstrate the quality and health of the process.
- Collecting measures to be submitted to the PMO to determine acceptable performance.
- Analyzing collected metrics for the functional area, both across projects and within each. If the trend is toward unacceptable performance, the FM is responsible for taking corrective action, including:
  - In an individual case, raising the issue with Project Manager, before taking disciplinary action.
  - Analyzing whether the process needs to be revised.
  - Addressing any training issues.
  - Identifying the cause; asking practitioners of the failing process to participate in cause identification.
  - If cause is related to another process, discussing the issue with the appropriate FM.
  - If justifiable (and until process can be changed), obtaining a waiver to not follow the documented process.

In addition to the responsibilities listed above, each FM has other responsibilities specific to his or her functional area. For example:

- The Scope Management FM also institutes a Change Control Board (CCB) and/or works with the customer's CCB to assess the impact of incoming change requests.
- The Risk Management FM also assists Risk Analysts in incorporating Stakeholders' risks situations, reaching outside the CITI project where it is in the best interest of the project's success for him to do so.
- The Technical Support FM also oversees the support of CITI internal customers, in addition to his activities in support of CITI's customer projects.

1.2.3 Project Manager's Role and Responsibilities within a Project

Whereas the FMs are focused on conformity to the processes and the metrics that illustrate the processes performance, the Project Manager focuses solely on the successful outcome of the project, which is his or her ultimate responsibility.

During a project's inception, the PM works with the FMs to ensure that there are resources available with the skills needed to perform quality work on the project task, based on the nature of the project. FMs work closely with all PMs to ensure that each project is staffed when needed.

The Project Planning and Oversight process defines the overall methodology that all CITI Project Managers will follow. It is based on both CMMI goals and practices and the Project Management Institute's Project Management Body of Knowledge (PMBOK®). The PM assumes full responsibility for the project and works within the PMO structure using all documented CITI processes, as described in the following section, to ensure that the project satisfies both stakeholder and corporate goals.

1.2.4 Process Area Interaction

CITI's processes are documented and measured as discrete aspects of work performed at CITI; however, each project team member will perform activities that touch multiple processes on a daily basis, because the individual processes are very highly coupled. *Figure 1* below illustrates this concept. The focal point is the Project Planning and Oversight process. Disciplined project management is at the heart of the entire CITI process set, because it is at the heart of emerging industry best practices, as well as our chosen process improvement models:

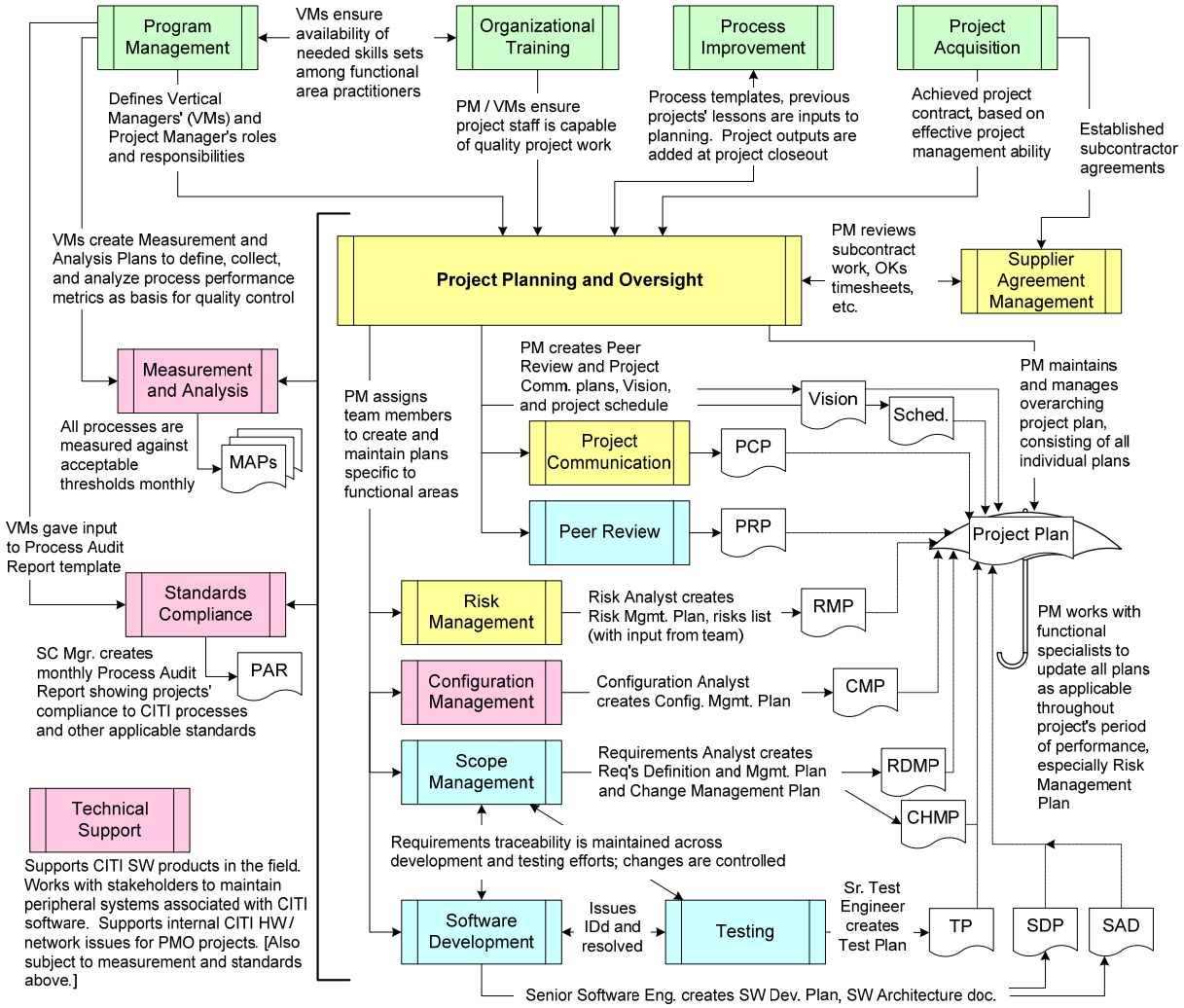

Figure 1. Process Area Interaction

NOTE: This figure specifically represents the process area interactions for a software development project; however, the same concept holds true for other, non-development types of efforts at CITI.

1.2.5 Methods of Inspections

We use the following quality control methods to administer this QCP. The Activity Checklist on page 6-18 helps ensure adherence to this plan while documenting the activities.

- Customer Feedback. Customer feedback may be obtained either from the results of formal customer satisfaction surveys, Monthly and Quarterly inspections in accordance with Quality Assurance Surveillance Plan (QASP). Customer complaints, to be considered valid, must clearly document the nature of the complaint, must be signed, and must be forwarded to the COTR.

  The COTR shall maintain a summary log of all formally received customer complaints as well as a copy of each complaint in a documentation file. The COTR Officer shall also keep the tabulated results of all customer satisfaction surveys on file and shall enter the summary results into the Surveillance Activity Checklist.

- 100% Inspection. This level of inspection shall be accomplished by monitoring each of the process areas and the accompanying documentation. Each month, the Manager of Standards Compliance

or the designated the appropriate FM shall review the generated documentation and enter summary results into the Audit Checklist.

- Periodic Inspection. Periodic project inspections shall be conducted on each service area for each individual task orders by the Divisional Managers and the cognizant Program Manager. For the potential tasks that have been identified so far and included in the Task Order QCP, the appropriate designated Quality Control Monitor typically performs the periodic inspection on a monthly basis.
- Random Monitoring. Random monitoring shall be conducted if and when specified in individual task orders or the trend shows declining trend in the statistical process control charts. For the potential tasks that have been identified so far and included in the Task Order QCP, the random monitoring shall be performed by the Project Manager or by the appropriate designated corporate officer such as Manager of Quality Initiatives.

1.2.6 List of Artifacts

Table 2 below lists documents we typically produce for task orders. A template for each is available online to all personnel through our web-based company portal.

Table 2. Process Artifacts

Process	Related Artifacts
Configuration Management (CM)	Configuration Management Plan (CMP)
Organizational Training (OT)	Skills Matrix Template (SKM) Training Evaluation (TE)
Project Communications (PC)	Agenda Template (AG) Meeting Minutes Template (MM) Meeting/Training Sign-in Sheet (MSI) Project Communications Plan (PCP)
Process Improvement (PI)	Lessons Learned Template (LL)
Project Planning and Oversight (PPO)	Process Compliance Matrix (PCM) Peer Review Plan (PRP) Software Project Management Plan (SPMP) Validation Plan (VP)
Risk Management (RM)	Risk Management Plan (RMP)
Supplier Agreement Management (SAM)	Consultant Agreement (CA) Non-Disclosure Agreement (NDA) Purchase Order (PO) Purchase Requisition (PR) Subcontract Agreement (SCA) Subcontractor Task Order (STO) Teaming Agreement (TA)
Standards Compliance (SC)	Process Audit Report (PAR)
Scope Management (SM)	Change Management Plan (CHMP) Change Request Assessment/Estimation (CRAE) Requirements Development & Management Plan (RDMP)
Software Development (SWD)	Software Architecture Document (SAD) Software Development Plan (SDP)
Testing (TST)	Testing Plan (TP)
Measurement and Analysis (MA)	Measurement and Analysis Plan (MAP)

1.2.7 Table of Standards

Table 3. Standards Applicable to Products and Services

Standard	Validation Method
Customer standards (Government-wide, Departmental, or Agency)	Validation criteria and method to be specified by the individual contract / task order customer; CITI will comply with all customer standards
CITI Independently Assessed CMMI Level 3 processes	Independent Assessment for CMMI Level 3 completed
ISO – 9001:2000 – Quality Management Plan	Independent Assessment for ISO-9001 completed

1.3 Plan Implementation at the Task Order Level

Quality Management (QM) is an integral part of our task management process. Through our QM approach, CITI's entire operations concept focuses on complete user satisfaction. Our program has two major components, Quality Control (QC) and Quality Assurance (QA). QC is the complete set of activities that contribute to delivery of products and services that meet or exceed the customer's requirements and standards. QA entails the procedures used to ensure that the work to be performed meets the defined specifications in all respects. Our staff continually seeks new ways to meet or exceed user expectations for quality and productivity. Our QM will include systematic observations, reviews, inspections, QA audits; identifying and fixing discrepancies; historical files of inspections and corrective actions; and polling customer managers and users (between monthly progress meetings) to determine the service quality. We discuss customer feedback in our quarterly corporate meetings as well. Similarly, we seek out employee expectations and measure the quality of the service provided by HQ to the project employees by conducting employee surveys every six months. Our QM approach will maintain all task order activities at optimum levels of performance through a process of continuous refinement of service level requirements with the COR.

Meeting Performance and Quality Standards. CITI's QM approach seeks to ensure that satisfaction is achieved by adhering to quality and performance standards. Through QC we set the metrics at strategic points throughout the tasks, so that any defects are identified early on and can be eliminated before becoming significant. Through our approach, we achieve increased productivity, product quality improvements and cost efficiencies in all SOW areas, because we do the job right the first time. This zero-defects approach takes up-front planning and control but, in the long run, is far superior to reworking defects. Our QM approach uses proven methods to collect and document user concerns, problems, and criticisms and practical techniques to ensure compliance with the customer's standards and goals. Our PMO along with our FMs are responsible for ensuring the implementation and achievement of our quality and performance goals.

An important part of our QM approach is our ability to maintain COTR visibility into our daily operations in two ways. The first includes the planning schedules that will be online under MS Project. This data provides the planned and in-process status for all assigned tasks at the lowest WBS level. The assigned Task Leader enters progress and work package completion. Labor hours expended (or committed) are updated weekly to provide the COR with up-to-date information on actual progress. The second approach to maintaining visibility is our daily formal and informal communication with the COR and technical managers about the status and progress of tasks under their responsibility. As stressed throughout our proposal, CITI managers believe that *full and open communication benefits both CITI and the customer.* In addition to the formal meetings called by the customer (such as design reviews and in-process reviews), our project staff will communicate regularly with customer managers and technical staff at all designated levels. It is through these communication channels that work quality is under constant observation, thereby ensuring the best performance.

1.3.1 Tailoring of QCP

Because of our experience with Government contracts, both single-agency and GWAC, we have developed QCP documents at two levels; one at the contract level and the other at Task Order level. The Contract Level defines our functional processes, methods of inspections of these processes, definition of defect and data metrics that we collect and the statistical controls we apply to monitor the processes. This document is the contract level QCP. It was developed and fine-tuned primarily at our largest customer, the U.S. Department of State, and has been tailored to meet the standards and expectations of our other customer agencies.

The Task Order Level QCP is a document that is an operational level document. It takes the QASP and SLA into consideration and defines the acceptable quality standards for every operational and development requirements. This document follows the Task Order SOW, SLA and QASP to develop internal QCP standards which will be stricter than the QASP. These standards will serve as our guiding standards to meet the task order requirements. This document will require prior approval of the Government Technical Manager (GTM) can be tailored to meet the required performance standards of the task order. Tailoring is defined as the addition, removal, or modification of any standard or its associated deliverable, review, or product control. The tailoring of the QCP is expected during the Due Diligence phase of the Transition Plan and written approval from the GTM must be obtained prior to entering the execution phase of the task order. Any specific changes to the QCP will be noted in the document in Tailoring Table.

1.3.2 QCP on Multiple Task Orders

Quality is the job of every individual working at CITI. At each Task Order level, we have the roles and responsibilities assigned to Quality Control Engineer, who in turn is guided by the Standards Compliance Leader at the Division Leader who in turn reports the status of the quality to Corporate QA Manager.

1.3.3 Organization Level Capability to Handle Multiple Task Orders

CITI has a full time professional engaged in promoting quality who reports directly to the CEO and to the cognizant Program Manager. This person serves as an independent Quality Control Manager, with general oversight of our processes, procedures, and methodology. In this role, he assists Program Managers at the contract level and Task Project Managers and Manager of Standards Compliance in establishing the appropriate project quality factors and attributes as defined in CMMI Process Documentation, and productivity improvement activities in accordance with corporate policies. We also have developed a PMO structure to support each division with in the company and have assigned the roles and responsibilities of Quality Assurance and Quality Control to the Manager of Quality Standards Compliance.

As stated above, the PMO is an organization based on a matrixed reporting structure. The structure focuses the PMO on a specific customer base to better meet the customer's expectations.

To achieve its goals, the PMO has employees grouped by functional or knowledge area. The specialists in these areas report to a Functional Manager (FM). The FMs report to a PMO Manager who in turn reports to the Division Manager and Program Manager and CEO.

FMs are assigned to areas such as development, quality assurance, risk management, and technical support. Employees report to this manager for all personnel related issues such as career growth, hours, vacation requests, and professional development. Employees in a knowledge area are responsible for following and improving processes in that area and for ensuring that there is consistency across projects. The implementation of the Functional teams allows individuals to work on each project only when they are needed, gaining experience on multiple projects while maintaining a consistent reporting structure.

The PM remains the key figure on each project. PMs negotiate staffing requirements for a project, manage and maintain the customer relationship, and assign project tasks to project team members. The organization structure allows us to leverage knowledge areas and encourage open communications.

1.3.4 Roles and Responsibilities

The roles and responsibilities of each leader in the PMO are defined in our process documents as follows.

Corporate Quality Initiatives Manager

Develop, maintain, and improve Corporate Quality Standards including Quality Control Plan,. Develop budget for quality initiatives, assess training requirements and ensure that the goals are met.

- Works with Program Managers, Divisional Manager and Project Managers to promote corporate initiatives with in the entire program.
- Chairs Quality Management Board meetings and seek approval of processes recommended by the Engineering Process Group.
- Maintains artifacts on internally developed Share Point portal.
- Provides oversight and assistance regarding process compliance for all defined project processes tailored from CITI's corporate standard processes.
- Tracks satisfactory closure of noncompliance issues.
- Assists PMs and/or FMs in performing action items resulting from process noncompliance as needed.
- Provides objective judgment regarding non-compliance situations, where needed. Escalates issues, as necessary, to the cognizant Program Manager.

Program Manager

- Provides corporate guidance on directives, standards, procedures, and policies. Develops Project Management guidance for all projects.
- Monitors all projects and ensures compliance with corporate standards, PMO practices, and industry best practices.
- Manages the career path of the FMs.
- Provides escalation path for Division Manager and customers for project concerns, scope modifications, high risks, and personnel issues.

Functional Managers

These managers are responsible for functional areas such as Risk, Scope, Configuration Management, Development, Testing, Database, Technical Support, and Security.

- Ensures consistency of process, standards, and artifacts within the functional area.
- Works with Project Manager to determine resources availability and assignments.
- Oversees career development and personnel management for members of the functional team.
- Negotiates for team members and project manager if customer requirements diverge from functional area standards.
- Works with functional team members to evolve and improve the processes.
- Collects and provides performance metrics to PMO.
- Conducts personnel interviews and evaluations.

Standards Compliance Manager

Standards Compliance involves ensuring that all projects are adhering to all corporate standards and the standard CITI defined, repeatable processes in their project work, as well as complying with any customer

mandated standards and processes. In addition, any non-conformance issues are identified and tracked to closure.

- Works with Project Managers to plan monthly audits of all applicable process areas for all ongoing projects.
- Performs regular process audits of CITI projects' compliance to written processes, completing a Process Audit Report (PAR) each month for each ongoing project.
- Provides implementation oversight and assistance regarding process compliance for all defined project processes tailored from CITI's corporate standard processes.
- Collects and maintains standards compliance related metrics via the Process Audit Report.
- Tracks satisfactory closure of noncompliance issues.
- Reports status of process noncompliance issues to Functional Managers and senior management.
- Assists PMs and/or FMs in performing action items resulting from process noncompliance as needed.
- Provides objective judgment regarding non-compliance situations, where needed. Escalates issues, as necessary, to PMO Manager and/or Division Manager.

1.3.5 Problem Notification and Tracking

Effective problem reporting and corrective action procedures are critical to a successful project. The dynamics of the interaction between the various stakeholders will usually lead to an occasional problem or issue. Although this project encompasses elements of both software maintenance and software development this QCP, while addressing both, will focus primarily on the procedures for the handling problems encountered in the software development activities. The correction of most software maintenance problems will follow an expedited set of software development procedures. The major difference is that software maintenance problems usually occur in the production environment, require expedited handling, and are not confined to a development life cycle phase.

Four major steps, depicted in *Figure 2*, accomplish effective handling of a problem:

- Identification and description of the problem,
- Early and continued communication to the stakeholders,
- Design of a corrective action plan,
- Implementation of the approved action plan.

Problems are identified by various means and can be submitted by any stakeholder via telephone, email, in a meeting, in a casual conversation, or formal testing results. The CITI Team considers any of these problem submission means are legitimate and subject to the procedures defined in this QCP.

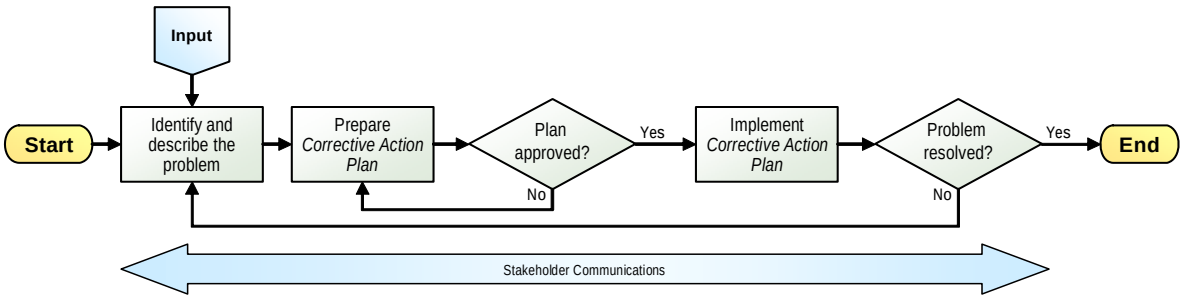

Figure 2. Problem Resolution Process

1.3.6 Escalation of Process Performance Issues

The Standards Compliance Manager is responsible for reporting on process compliance to the PMO. If there are non-compliance issues, the PMO Manager addresses them with the FM, and the FM addresses them with the Project Manager and the individual, as necessary. If the FM Manager cannot get satisfaction with the PM, then the issue is escalated to the PMO Manager. The PMO Manager will resolve any differences between Functional and Project Managers. If for some reason, the issue cannot be resolved within the PMO, then the PMO Manager will raise the issue to the Division Manager.

Any issues that arise through non compliance with a process (as identified by a FM) will be addressed directly with the team member and the Project Manager. If there is an issue between a PM and a FM, or two FMs, the issue is escalated to the PMO Manager.

FMs are responsible for the individuals within their functional areas, so if they have issues with their team members, they can take disciplinary action. If there is an issue between the customer and an employee, the PM and the FM will reassign the employee (with the customer's permission).

PMs are responsible for employees on their project, so if they have irreconcilable differences with a team member, they can go to the FM for a different resource (and to have the problem employee reassigned).

Quality of Service	Responsibility	Escalation	Corrective Action(s)	Communication Methods to Customer
Exceeds	Engineers, Analysts and entire team	Not Required	Formal Operations Management Meeting and QMB Meeting	Monthly Report
Satisfactory	Project Manager	Division Manager/ Program Manager	Division Manager to address issues, alert Program Manager/CEO of an Corrective Action Plan	Periodic Report - Presented in a Formal meeting to the Task Manager, COR, COTR, CO.
Unsatisfactory	Project Manager, Division Manager	Program Manager President/CEO	President/CEO to develop a report and address issues and corrective action plan with the customer	Periodic Report - Presented in a Formal meeting to the Task Manager, COR, COTR, CO, any other official in the customer organization

Key to successful project delivery of quality work products and to the achievement of project performance standards is effective controls, thorough reviews, testing, and adherence to established processes. The first step in building a QCP with effective controls is defining the applicable standards that the controls are required to meet. These standards are defined in the QCP. Implementing effective controls involves defining appropriate reviews within the CMMI framework to integrate QCP procedures at the most beneficial time allowing for any necessary corrective actions to occur without negative impacts to the project release schedule. These reviews are tracked and reported as milestones in the project Work Breakdown Structure (WBS). The reviews ensure that the deliverables, schedule, resources, and scope of the project are on track according to the current phase of the SWD lifecycle and that the deliverables meet the quality and performance standards established by the customer. These reviews ascertain the completeness, consistency, adequacy, accuracy, and risks for the requirements, design, technical specifications, and testability of all Configuration Items (CIs) within a release. The testing process, beginning during the build phase with unit testing, is paramount to a successful release. Testing resources must be as independent of development resources as the project staffing allows. A comprehensive testing program from unit testing through system, integration and user acceptance testing verifies that business functional and performance requirements are met and that defects are detected early in the lifecycle of the release.

Our quality control concept incorporates the daily execution of the project processes, periodic project status reviews with the customer, and thorough testing of the deliverables in concert with the approved Configuration Management Plan (CMP) and Project Management Plan (PMP).

Tying all of these processes together to create a quality delivery requires disciplined project controls. Each review and test sequence must be tracked in the WBS and defects must be recorded, reported and corrected in a timely manner. A critical aspect of project controls is the inter-group coordination and approval process that ensures that impact analysis is performed to prevent a negative consequence on upstream or downstream systems. This is normally accomplished through a Change Control Board (CCB) approval process where all impacted systems review the proposed changes and sign-off before moving forward to the next phase. Taking these external steps in conjunction with following the procedures set forth in the Configuration Management and Project Management Plans will help ensure that when a release is promoted to production it will work and it will meet the performance standards established by the customer.

We recognize that the customer will normally retain Quality Assurance Surveillance Plan (QASP) responsibility for project oversight and the CITI Team highly encourages QA Audits, which we will support and participate. QA Audits are an essential part of ensuring quality delivery is repeatable from a process standpoint. They are normally accomplished through an audit of documentation that substantiates that the delivery team is using the approved processes, forms, templates, and coding standards. Defects are identified, documented along with a corrective action plan, and tracked. When the customer retains these processes this QCP will only describe the overlap of the reviews defined in the QA Guidelines with industry standard IT practices that facilitate the promotion of defect free software products in a production environment that are acceptable, reliable, and maintainable.

1.3.7 Defects or Deficiency

Defects are commonly defined as “failure to conform to specifications or SLA,” or “incorrectly implemented specifications and specified requirement(s) missing from the product/solution/service.” We follow a broader definition of defect: *variance from a desired attribute.* These desired attributes include requirements and specifications that are complete and correct, designs that meet requirements, and programs that observe requirements and business rules.

1.3.8 Implementing an Effective Deficiency Tracking Process

Our Quality Assurance processes have been assessed at CMMI Level 3. Combining these QA processes with our CMMI Level 3-compliant Measurement and Analysis processes gives us a very comprehensive defect tracking process to effectively minimize defects while reducing the cost of quality over time. Our tracking process includes logging issues as they are found, investigating them, and then implementing ways to prevent the same issues from occurring again by conducting a thorough “lessons learned” sessions.

1.3.8.1 Logging Defects in a Repository

Once a defect has been discovered, the important first step is to log the defect into a defect-tracking database or repository. When a defect is logged, it must be fully described so that it can be reproduced during debugging, prioritized based on its severity, and have resources assigned for its resolution. Defects have a number of other attributes that should be recorded, such as *defect number, date,* the *build and test platform* in which it was discovered, the *application requirement or business rule* to which it relates, and any *supplementary notes*. Our defect tracking system is based on internally developed Share Point portal.

It also is important that the repository offer a means to track the “life” of the defect (the resolution status) and historically report on all defects discovered and logged for the project. It pays to have this system online and available to all development staff so that the assigned parties can update the resolution progress for the defect status.

1.3.8.2 Prioritizing Defects

[redacted]

metrics for the Software Development functional area can be rolled up by Testing, Code Review, and and Development/Scheduling, or we can choose to look at discrete metrics such as issues discovered by discovered by phase.