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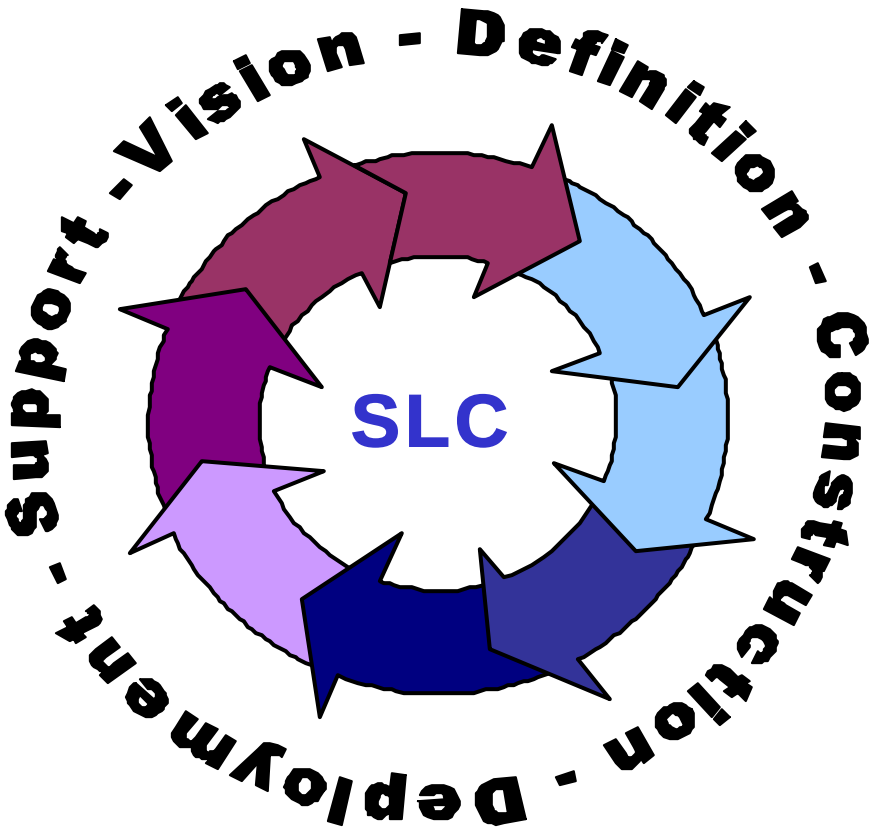

The Solution Life Cycle

Quality Assurance Process Guide

Version 2.0
January 20, 2003

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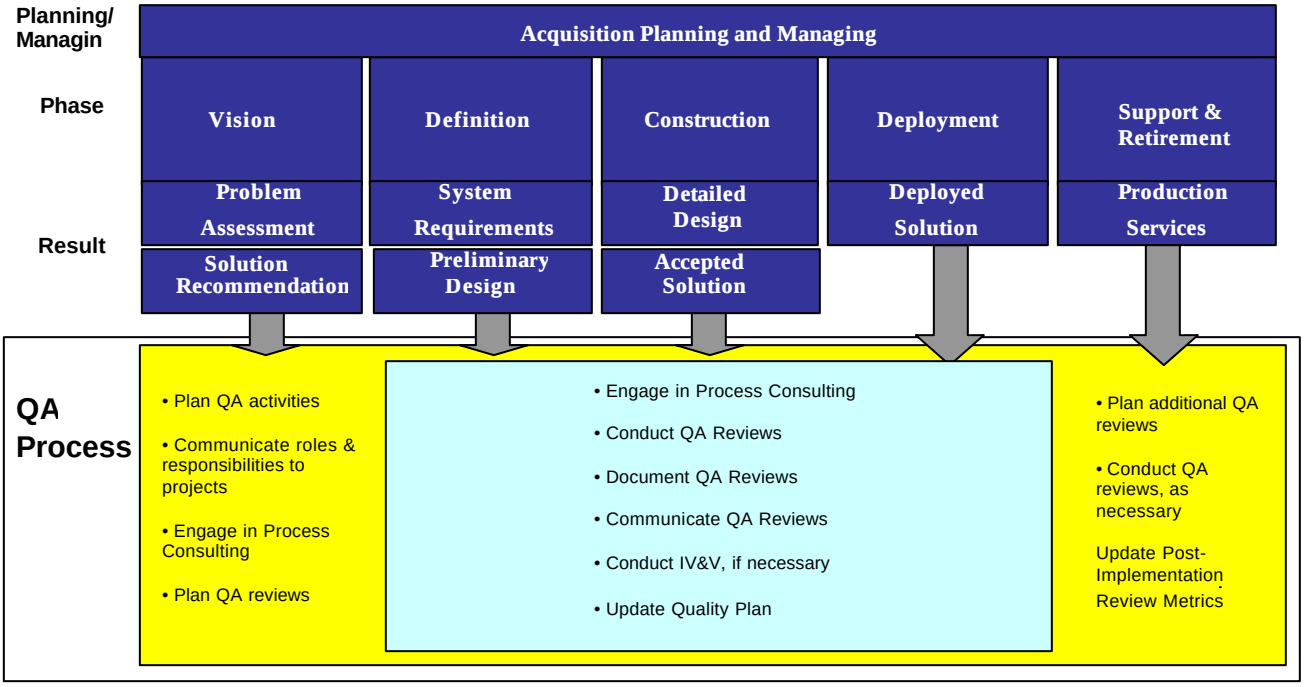
1. Introduction

The purpose of this document is to centralize and publish the FSA Quality Assurance (QA) process, including templates and tools.

The FSA QA Team will use this process to identify, perform, and follow up on planned QA activities. In this process, the FSA QA Team and the QA Task manager learns how to identify, document, and plan for QA activities and what to expect from a QA review. This document clearly defines the processes employed by the FSA QA Team. *Refer to Section 4 in this Process Guide for details of Roles and Responsibilities of the FSA QA Team.*

1.1 Overview of Quality Assurance in the SLC

Quality Assurance activities begin in the Vision phase with planning and process consulting. In the remaining phases, QA Reviews are conducted to verify adherence to plans, standards and processes. Specifically the FSA QA Team helps the project team ensure that they are building the right system and building that system right.



1.2 Tailoring and Agreements

Tailoring (i.e., customizing a process to meet specific project needs) and securing agreements (i.e., obtaining approval of a request to waive a specific requirement) must be approved on a case-by-case basis by the FSA QA Team.

2. Quality Assurance Overview

2.1 Purpose

The purpose of Quality Assurance is to provide management with appropriate visibility into the process being used by the project and ensures that the products being built adhere to the appropriate development standards.

2.2 Definition

Quality Assurance involves reviewing the processes, products and activities to verify that they comply with the applicable procedures and standards and providing the project and other appropriate managers with the results of the these reviews.

The FSA Quality Assurance Team works with the project IPT during in the early stage to establish quality plans, standards, and procedures, which will add value to the project and satisfy the constraints of the project and the organization's policies. By participating in establishing the plans, standards, and procedures, the quality assurance group helps ensure that they integrate with the project's needs and verifies that those processes (the "what"), e.g. the Configuration Identification Process, and procedures (the "how"), e.g. establish a Configuration Item Library, will be usable for performing reviews throughout the life cycle. The FSA QA Team reviews project activities work products throughout the life cycle and provides management with visibility as to whether the project is adhering to its established plans, standards, and procedures.

Guiding Principles

Quality Assurance uses the following guiding principles:

- Quality Assurance activities are planned;
- Adherence of products and processes to the applicable standards, procedures, and requirements are verified objectively;
- Affected groups and individuals are informed of quality assurance activities and results by MORs, status reporting phase, risk metric and Phase Transition Reviews (PTRs);
- The Quality Assurance Review team shall communicate findings in a timely manner;
- Quality Reviews will be conducted early in each SLC phase to help prevent and improve project processes and work products;
- Open communication exists between the FSA QA Team and the task managers;
- Compliance issues are first addressed within the project and resolved at lowest level possible;
- For issues not resolvable within the project, the FSA QA Team escalates the issue to the appropriate level of management for resolution.

2.3 Benefits

The benefits of the QA process include:

- Projects perform more effectively by using streamlined and tailored repeatable processes;
- Project members are better trained on day-to-day quality expectations which yields more consistent results;
- Projects are able to deliver higher quality deliverables in less time and with reduced costs.

3. Quality Assurance Processes

3.1 Quality Assurance Planning

The QA Task manager develops the project's QA plan and participates in the development of other project plans, such as the Solution Acquisition Plan (SAP) and the project's Work Breakdown Structure (WBS).

3.1.1 Entrance Criteria

- Project has an approved Business Case, or the appropriate project start-up approval, depending on project.

3.1.2 Inputs

- QA Plan Template; *(see Section 5)*
- Project objectives, context, requirements and metric;
- Project constraints (e.g., schedule requirements mandated by management or law, lack of funding, and limited resources);
- Available risk information;
- Applicable standards, processes, procedures, guidelines, templates, tools, and methodologies;
- Applicable policies.

3.1.3 Process

A QA plan is prepared for each project using the QA Plan template provided as guide or other appropriate QA Plan template. If another QA Plan template is used, the QA Task manager should identify that all key information such as dates and responsibility of reviews is detailed in the plan.

The QA plan is developed in parallel with the acquisition planning effort and the project planning effort. Planning defines the participation of the QA groups, the project's QA members and FSA's QA Team, in work product and process reviews. Updates to the QA plan will be controlled in accordance with the project's configuration management process. A schedule for QA activities is incorporated into the Work Breakdown Structure (WBS). The WBS includes the master schedule for the project. The Solution Acquisition Plan (SAP) should refer to the QA plan and the WBS for the QA schedule and assigned QA responsibilities.

The QA Task manager, the Task manager and the FSA QA Team representative must approve the QA Plan. (If other team members also need to approve the QA Plan, this is dealt with on a case-by-case basis.)

3.1.4 Outputs

- Approved QA Plan;
- WBS includes QA-related activities;

3.1.5 Exit Criteria

- The project's QA Plan conforms to the QA Plan template or selected template;
- The QA Task manager and the FSA QA Team representative have reviewed the QA plan, and have approved the QA Plan.

3.2 Process Consulting

The FSA QA Team representative consults with the project IPT on an ongoing basis to form a partnership in the area of process improvements. Typical activities include observing process deficiencies and advising on process changes, new policies or guidelines, and overall quality objectives. The FSA QA Team representative participates in reviews and consults on the tailoring of processes and work products (such as software engineering documents).

3.2.1 Entrance Criteria

- Any additions, changes or deletions to policies and / or objectives;
- Project team's input on processes or procedures to be evaluated.

3.2.2 Inputs

- Organizational changes in process areas;
- Project changes in process areas;
- Open process issues.

3.2.3 Process

In addition to quality assurance planning, the organization QA group is available to the project team to provide consultation and training with regard to:

- Compliance with standards, policies, processes and procedures, especially any changes;
- Compliance with externally imposed standards and requirements;
- Selecting processes that are appropriate for use by the project;
- QA orientation for new team members;
- Any tailoring of QA plan.

The FSA QA Team representative and QA Task manager support projects in establishing commitments, monitoring status with respect to commitments, and improving projects' products and processes. The FSA QA Team representative can also advise in the following activities: developing the Solution Acquisition Plan (SAP), the Configuration Management Plan (CM), and developing project standards, and reviewing and analyzing metrics, as appropriate. Further the FSA QA Team representative will support process-tailoring efforts.

3.2.4 Outputs

- Process changes are accepted, rejected or modified. Changes are tracked and monitored through documentation and Configuration Management.

3.2.5 Exit Criteria

- All process issues are documented and tracked to monitor progress.

3.3 Quality Assurance Reviews

The organization FSA QA Team representative(s) evaluates activities and work products for compliance with applicable procedures, standards, and policies, as well as, completeness, consistency, appropriateness and applicability. Where applicable, checklists are used. Generalized process checklists are provided in this document and the QA handbook. Additional, specific checklists may also be provided with each IT Architecture Standard or procedure.

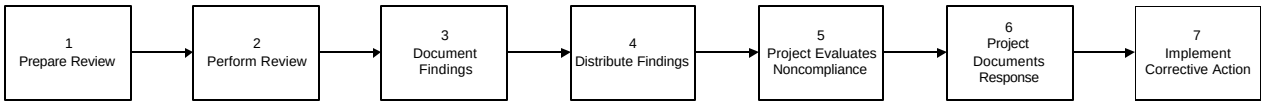
3.3.1 Entrance Criteria

- Work product is ready for evaluation, or activity is in progress;
- Evidence of activity is available, such as minutes or emails;
- Evaluation has been scheduled and a checklist has been sent to the QA Task manager;
- Project team understands the evaluation criteria and sampling method.

3.3.2 Inputs

- Work product;
- Objective evidence (e.g. related documents) of performance of activity;
- Applicable standard, procedures, processes, policies, checklists;
- Approved QA Plan;
- Sampling criteria;
- Organization policies.

3.3.3 Process Flow



3.3.4 Process

1. Prepare Review

QA reviews at the project level are conducted in accordance with the schedules documented in the QA Plan and the WBS. Those involved in the QA review should be adequately trained in the QA process prior to the review. Affected team members will be reminded about the evaluations through regularly scheduled project status meetings. The project team and the FSA QA Team representative determine the scope of the evaluation and tailor the evaluation procedure based on the phase of the project and other project-specific circumstances, during the planning process. The primary goal of the preparation session is to:

- Identify both the work products and the processes to be reviewed, as stated in the project's QA Plan.
- Make appropriate documentation available to the FSA QA Team representative. This includes:
    a. Standards, guidelines, and tailored checklists;
    b. Work products;

2. Perform Review

The FSA QA Team representative evaluates work products by verifying their compliance to the applicable standards, guidelines or checklists, as well as, completeness, consistency, appropriateness and applicability. Prior to the review, the FSA QA Team representative will make the announcement to the team that a QA review will take place, if it is not already in the project's timeline. After the meeting, it is recommended that an email be sent from the FSA QA Team to the QA Task manager that will provide all supporting artifacts in preparation for the review. The Task manager, the IPT Lead and key members of the project team should also be copied on this email.

- Processes are reviewed for compliance to the appropriate plan, procedure or checklist.
- Quality records are reviewed to assist in confirming an activity's compliance to a procedure.
- If documents are not adequate to confirm compliance or identify noncompliance, then the FSA QA Team representative may interview project team members.
- Sampling is adapted to maximize efficiency (because organizational QA resources are always limited, and a 100% sampling is impractical, there are several methods to maximize efficiency):
    a. The FSA QA Team representative may sample issues as agreed to by the project and the FSA QA Team representative. (If possible noncompliance issues are uncovered during the review, the FSA QA Team representative has the authority to select optional work products or processes, above and beyond those itemized in the project QA plan for further evaluation.)
    b. They may sample issues itemized in the project's improvement plan, if applicable.
    c. The FSA QA Team representative may attend key process meetings to observe process compliance, and issues raised during these events.

3. Document Findings

The FSA QA Team representative documents all noncompliance issues in a Memorandum of Record (MOR) document.

There are 3 categories of findings:

- Major noncompliance – schedule risk, feature risk or incorrect metrics;
- Minor noncompliance – all others;
- Observation – potential improvement opportunity.

Refer to QA/IV&V process for additional categories for documenting findings.

4. Distribute Findings

The MOR is first released to the FSA QA Team Lead for review and approval. Then the MOR is shared and discussed with the QA Task manager, the Task manager, the IPT Lead and key team members for review and resolution. Alternatively, the FSA QA Team representative may place the findings in a project document repository and notify the appropriate personnel that results are available.

5. Project Evaluates Noncompliance

All appropriate parties meet, discuss and come to an understanding of MOR findings. The project team then works to resolve all noncompliance issues and communicates their status to the FSA QA Team.

6. Project Documents Response

All resolved items must be supported with artifacts. The QA Task manager will be the coordinator for these quality records.

There are 3 milestones associated with the MOR:

- Initial Project Response Date on an action item;
- Issue Resolution Date;
- Date the issue closed or escalated.

Disposition can include "no action and state rationale," "project team's action plan to improve," or "project team will seek waiver or specify tailoring requirement in the future." The project team will update the MOR with a cover letter signed by the Task manager or a designee.

The organization FSA QA Team representative then approves the updated MOR and distributes to the team, and schedules a meeting with the team to share project findings.

7. Implement Corrective Action Plan

The FSA QA Team tracks and monitors the resolution of noncompliance items either by corrective action or an acceptable documented rationale. Where necessary, the FSA QA Team conducts follow-up evaluations of the corrected process or work product.
For items requiring action, the project team will forward the updated MOR and a cover letter signed by the Task manager, together with the Corrective Action Forms, on the corrective action due date.

3.3.5 Outputs

- Memorandum of Record (MOR) with QA metrics is shared with project team.
- Evaluation reports of contracted documents.

- Final QA IV&V report.
- Lessons learned

3.3.6 Exit Criteria

- MOR signed off by FSA's QA Team representative.
- Final QA IV&V report, including lessons learned signed off.

3.4 QA/IV&V Evaluation and Selection

Initial selection of Industry Partners is accomplished by seeking out those companies that may be recommended to FEDSIM or FSA as possibly appropriate to the Independent Validation and Verification (QA/IV&V) program. Additional possible Industry Partners are discovered by the voluntary entry of an organization into the process. These volunteers are frequently following up on information provided to them by an information service, such as FedSource, or they are following up on the old Commerce Business Daily (CBD) announcement for interested small business, placed by FSA's acquisition organization in October 2000.

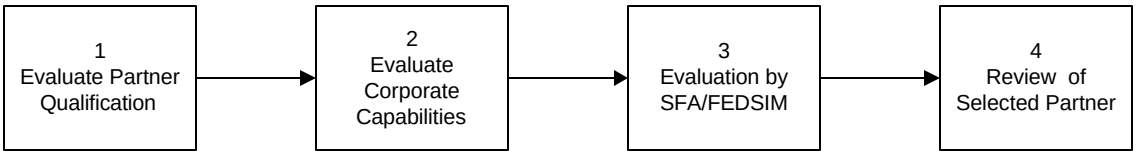
3.4.1 Entrance Criteria

- Need for QA/IV&V effort is identified.
- Need to select a QA/IV&V Partner is recognized.
- QA/IV&V Partner volunteers and services.

3.4.2 Inputs

- Objective evidence stating the need for QA/IV&V process.
- Partner qualification criteria require evaluation.
- Partner corporate capabilities package is requested by FSA.
- Request for Quote (RFQ) has been submitted by FSA.

3.4.3 Process Flow



3.4.4 Process

1. Evaluate Partner Qualification

Prospective Industry Partners are further qualified, prior to requesting corporate capabilities, by using the following tools:

- FEDSIM checks the SBA PRO-Net Database for confirmation of 8(a) status.
- FEDSIM checks the List of Parties Excluded From Federal Procurement and Nonprocurement Programs for exclusion of a possible Partner.
- FEDSIM checks the Dun and Bradstreet database for corporate history and financial strength.
- FEDSIM checks the FedMarket Mammoth Vendor Directory for information consistency
- FEDSIM checks the Federal Supply Service (FSS) Schedules listing to confirm that a current Schedule contract is in place.

2. Evaluate Corporate Capabilities

Possible Industry Partners that pass all of these checks are then sent a request for corporate capabilities. The request currently consists of the following items:

- Executive Summary.
- Corporate capabilities statement, in reference to QA / IV&V.
- Sample of an QA / IV&V procedure used or developed by the organization.
- Example of two previous QA / IV&V efforts performed by the organization.
- Understanding of the requirements of an QA / IV&V effort.
- Management approach to staffing and maintaining an QA / IV&V effort.
- Technical approach to an QA / IV&V effort.
- Model resumes of the type of staff proposed.
- Contract availability, provide your GSA Schedule information and confirm your status under the SBA's 8(a) program.

3. Evaluation by FSA/FEDSIM

Upon receipt of the corporate capability packages, FSA performs an analysis of the information to provide a list of the best qualified of the possible Industry Partners.

FEDSIM uses the recommendations of FSA to build the list of possible Industry Partners to request a quote form. These Industry Partners are sent a Request for Quote (RFQ) against which FEDSIM instructs them to provide cost data, a staffing plan, and present any assumptions that they might have made to prepare their offer.

FEDSIM and FSA then evaluate the offers, based on a best value to the Government paradigm. The Industry Partners' capabilities, staffing plan and assumptions are evaluated, as having a greater value to the Government than the cost of the offer.

4. Review of Selected Partner

Once a Partner meets the FEDSIM and FSA evaluation criteria and is selected as the FSA operating Partner for QA / IV&V activities, the Partner undergoes further reviews by FSA and the project team, as follows:

A. Five Step Implementation
   1. Assess QA IV& V needs for a planned project.
   2. Tailoring procedures to fit schedule and budget.
   3. Execution of evaluation tasks, development and CM.
   4. Measuring and analyzing results of QA / IV&V to identify project risk and deficiencies.
   5. Provide analytical feedback, "Value Added" to improve quality and reliability.

B. 8(a) Contractor Performance Measures:

1. Technical
   a) Error rates – number of mistakes / errors allowed in meeting the performance standard
   b) Accuracy rates – similar to error rates, but most often stated in terms of percentages
2. Schedule
   a) Response times,
   b) Delivery times,
   c) Meeting deadlines, milestones or due dates,
   d) Adherence to schedule
3. Cost
   a) Keeping within the estimated cost or target costs. (Applies to cost-reimbursement contract arrangements)
4. Business
   a) Quality and availability of assistance
   b) Flexibility and responsiveness to changing requirements & priorities.
   c) Effectiveness & timeliness of communication

C. Quality Assurance 8(a) Contractor Performance Metrics:

Designation:	**Type of Measurement:**	**Method of Measurement:**
Technical	Quality (Error Criticality)	100% Review of Deliverable (Cri vs. Non-Critical)
Schedule	Time (Schedule / Timeliness)	100 % Schedule Review. (Reports and Assessments)
Cost	Funding Committed ($)	Based on Contract Type. (FFP – Price Schedule) (LH / T&M – Burn Rate)
Business	Customer Interaction / Flex	Evaluations and Surveys. (Stakeholders / IPT Members and ED Staff)

D. QA / IV&V Applied in Three Different Manners:

1. Full Life Cycle – Based on selected SLC and development methodology the QA / IV&V activity will follow the five phases: Vision, Definition, Construction, Development and Support & Retirement.
2. Partial Life Cycle – Based on the selection of one or more of the Pre-Construction Phase product activities supported with IV&V (also, known as the QA IV&V "Lite" Approach).

3. Risk based assessment support that provides mature applications with analysis that fits funding constraints. (QA IV&V "Ultra-Lite" approach)

3.4.5 Outputs

- Potential QA / IV&V Partner meets preliminary FEDSIM selection conditions.
- Corporate Capabilities Package is submitted for analysis to FSA and FEDSIM.
- FSA / FEDSIM conduct evaluation of potential Industry Partners.
- Quality Assurance 8(a) Contractor Performance Measures are applied to potential QA / IV&V Partner.

3.4.6 Exit Criteria

- QA / IV&V Partner is selected after meeting selection criteria.

3.5 External Review of QA Activities

3.5.1 Entrance Criteria

- External review has been scheduled.

3.5.2 Inputs

- QA policy, QA Process guide, QA plans, QA checklists, QA guidelines;
- Results of QA activities, documented in Review Reports and minutes;
- Available project team members for interviews, if necessary, for any clarifications.

3.5.3 Process

The organization policies state that either an external group or consultants must review the FSA QA Team's activities for compliance, periodically. Any risk management issues will also be addressed. These activities must be part of the FSA QA Team's overall plan and schedule for the organization. Just as with internal reviews, the FSA QA Team must be informed prior to the hiring of external reviewers and funding commitment has to be made.

3.5.4 Outputs

- Review report;
- Findings briefing.

3.5.5 Exit Criteria

- Review report completed;
- Findings briefing conducted.

4. Quality Assurance Roles

The QA process requires several roles, some of which can be performed on a part-time basis. The following is a description of the QA roles and responsibilities:

1. FSA QA Team/FSA QA Team Representative

The FSA QA Team is responsible for performing QA reviews for FSA projects. The FSA QA Team helps a project meet its quality standards by referencing best practices resources and process methodology. In a QA review, the FSA QA Team analyzes acquisition process, project processes, project deliverables and software development documentation for completeness. Furthermore, the FSA QA Team interviews project members (of all levels) to ensure they are following the processes and standards established by the project. After the review is conducted, the FSA QA Team is responsible for documenting the findings of the project's QA review, which include issues identified, and recommendations for resolving them. In addition to delivering feedback to the project, the FSA QA Team follows up with the project after the review to determine whether or not the project has addressed all of the items identified in the review.

The FSA QA Team is also available to review the SAP, the Business Case, and the Task Order for completeness, clearness, relevance, and value.

2. QA Task manager/Project's QA Team

The QA task manager is responsible for ensuring the project is performing all of the QA tasks identified by the task. The QA task manager is also responsible for coordinating QA activities (such as scheduling QA reviews) and acting as the liaison between the FSA QA Team and the project. Frequently, the QA task manager is responsible for either creating, or supervising other project members in the creation of QA documentation, such as the QA review schedule and procedures for QA activities. The QA task manager responsibilities are performed on a part-time basis.

3. Project Members

All project members play an active role in the QA process. The following outline the common expectations for all of project roles:

- Follow the QA tasks identified by the project;
- Identify issues and provide feedback on them to the QA task manager;
- Participate in the QA reviews by describing the actual processes used by the project;
- Help resolve issues identified during a QA review and act on the resolutions.

The QA task manager selects project members to participate in a review. Project members are selected based on their roles and responsibilities on the project.

5. Templates and Examples

This section contains templates and examples for the QA initiative.

5.1 Quality Assurance Plan Template The QA Plan template is used to create a project quality plan. A project may use the template to document a quality plan that contains QA activities.	"Quality Assurance Plan Template V2.0.d
5.2 Quality Assurance Process Checklists The QA Process Checklists are used to review current processes at FSA including acquisition planning, project management, requirements development and management, configuration management, and transition to support.	"Quality Assurance Process Checklists V2
5.3 Corporate Capabilities Evaluation Worksheet The Corporate Capabilities Evaluation Worksheet is known as the GSA/FEDSIM Interagency Service Agreement, and is designed to evaluate contractors in ten key areas. The worksheet contains two, one-page documents, for the purpose of summarizing a contractor's Overall Strengths and Overall Weaknesses.	"QA Corporate Capabilities Evaluatio
5.4 RFQ Proposal Review Form The RFP Proposal Review Form is used to document vendor selection data and comments regarding individual quote proposals to support vendor out brief activities. .	"Quality Assurance RFQ Proposal Review
5.5 QA Contractor Performance Survey The QA Contractor Performance Survey measures the QA/IV&V contractor's process effectiveness in regards to their contract performance measures. This survey is completed the ECAD/QA staff member assigned to the particular IPT development effort and the QA team leader.	"Quality Assurance Contractor Performar
5.6 Customer Satisfaction Questionnaire The QA Monitoring Survey measures the QA /IV&V contractor's process effectiveness. This survey is to be completed by FSA personnel who come in contact with an QA/IV&V effort	"Quality Assurance Customer Satisfactior

6. Document History

Author	Date	Version	Description