

environment. The contractor shall assist in:

- o Defining, analyzing and documenting QA program requirements.
- o Developing and performing Quality Control (QC) procedures and evaluations on work products delivered by other contractors.
- o Identifying and developing automated methods and tools for applying quality factors and measurements to other contractors software prior to and during the software development.
- o Continued refinement and implementation of a Systems Development Life Cycle (SDLC) approach to application systems development, establishment of design reviews during the systems development process, and development of ADP standards, procedures and conventions, including development of a computer resource life cycle management plan.
- o Performing QA evaluations of QC procedures and products related to the PTO's automated systems.
- o Performing quality assessment of PTO's automated systems and recommending corrective processes and actions where applicable.
- o Providing support for QA audits and internal reviews.
- o Evaluating other contractors' software engineering maturity and software engineering programs, and formulating improvement plans, when needed.

C.4.3 CONFIGURATION MANAGEMENT SUPPORT

The contractor shall advise and assist the PTO in execution of an agency-wide Configuration Management (CM) program. Included, as necessary, will be assistance in:

- o Enhancement and implementation of the PTO's CM plan for the application of CM practices and procedures for application systems. This includes:
 - Defining, analyzing and documenting CM program requirements.
 - Identifying automated tools associated with an Integrated Product Support Environment or Change Control Management.
 - Developing CM procedures and conducting evaluations of work products delivered by other contractors,

including but not limited to, the assessment of their configuration management plans, procedures and practices to ensure conformance with PTO requirements.

- Identifying and satisfying the management information requirements for configuration data including, but not limited to, the establishment and maintenance of component inventories of documents, software and hardware, component connectivity, and integration of Configuration Change Control vehicles (i.e., Modification Request (MR), Change Request (CR), Discrepancy Report (DR)). This shall include coordinating and controlling changes to PTO's production and test configurations.
- Providing support for hardware configuration audit activities, including preparing plans for and conducting functional and physical configuration audits of other contractors' deliverables.

C.4.4 INFORMATION TECHNOLOGY SECURITY PROGRAM SUPPORT

The contractor shall provide assistance to the PTO in the development and implementation of the information systems security program. This assistance shall include, but is not limited to:

- o Development of security control, audit and testing capabilities.
- o Development of information technology/resource inventories.
- o Development, execution, and audit of risk management plans, contingency plans and disaster recovery plans for PTO developmental and operational automated systems.
- o Conduct of security risk assessments on the physical, personnel, and accessibility aspects of PTO facilities and computer systems.
- o Support for the development, implementation and management of individual system security plans, including implementation of information security and data integrity concepts.
- o Development of security assessment and compliance measurement strategies.
- o Development and conduct of special security compliance studies and identification of strengths, weaknesses, vulnerabilities, alternatives and corrective actions, when required.

C.4.5 IV&V, SOFTWARE AND PRODUCT ENGINEERING SUPPORT

C.4.5.1 The contractor shall provide support for the independent verification and validation of system designs and alternatives, engineering fabrication and testing designs, and technology alternatives and methodology development. The contractor shall assist the PTO in defining and documenting test and evaluation objectives, procedures and methods, (including automated testing tools) and shall participate in the conduct of system acceptance tests and evaluations performed on the system development and integration contractor's products. The contractor shall identify and develop testing methodologies and documentation, generate testing protocols and make independent assessments of accuracy, completeness, consistency, feasibility, and compliance with standards and requirements. As required, the contractor shall document recommendations for improvement or correction.

C.4.5.2 At the PTO's direction, the contractor shall develop audit procedures and performance standards and shall perform independent audits against system baselines. The contractor shall review and assess technical and management documentation to determine conformance with related requirements, technical baselines and adherence to specified standards. Documentation identified for contractor review and comment shall include, but not be limited to: Program Performance Specifications, Program Design Specifications, Data Base and Subsystem Specifications and Operation Manuals. Some of this documentation may be the products of other contractors.

C.4.5.3 As required, the contractor shall attend the systems development and integration contractor's System Design Reviews, System Requirement Reviews, and Comprehensive Design Reviews.

C.4.5.4 The contractor shall develop and execute plans for ensuring the traceability of automated systems with associated engineering development and test specification. The contractor shall participate in system and subsystem test planning and validation of test results against the technical baselines.

C.4.5.5 The contractor shall perform evaluations of data base management and integrity design.

C.4.6 TEST AND INTEGRATION SUPPORT

C.4.6.1 The contractor shall provide support for all activities required for acceptance testing, integrating and installing enhancements and/or modifications to PTO automated systems within the framework of a baseline concept. A baseline consists of a variable number of software capabilities to be acceptance tested, integrated, and installed into an ADP production environment within a specific timeframe. The contractor shall also support planning for installation and acceptance of subsequent baselines to include scheduling,

coordination, installation, testing, and problem resolution support, and administrative/quality assurance support.

C.4.6.2 As required, the Contractor shall participate in the various SDLC test readiness reviews, and shall provide support in reviewing test plans, test specifications, and test procedures.

C.5 CONTRACT DELIVERABLES

C.5.1 The following shall be delivered to the PTO as required in accordance with the format and criteria shown in Attachment J4 and listed in Section J.

- a. Monthly Status Report (Contract Deliverable No. PM01).
- b. Letter of Completion (Contract Deliverable No. PM02).
- c. Special Study and Analysis Report (White Paper) (Contract Deliverable No. PM03).
- d. Problem Notification Letter (Contract Deliverable No. PM04).
- e. Minutes of Monthly Task Order Status Review (Contract Deliverable No. PM05).
- f. Minutes of Meetings (Contract Deliverable No. PM06).

C.5.2 Other technical products shall be provided to the PTO as required in task orders. When required, products shall be provided in paper or electronic form, or both.

C.5.3 Software documentation shall be provided to the PTO by the contractor as requested and specified in each task. This documentation shall conform to Federal Information Processing Standards (FIPS).

C.6 PROBLEM NOTIFICATION

The Contractor shall notify the PTO's Contracting Officer and COTR immediately of all problems that impact or potentially impact the contract, deliverable(s) or project schedule. Such notifications shall be made verbally during normal work hours or at the beginning of the next Government work day. For each problem encountered, verbal notification shall be followed by a written report to the Contracting Officer and copy to the COTR within 24 hours after the identification of the problem. This written report shall be submitted in accordance with the format and criteria contained in Contract Deliverable PM04 (Problem Notification Letter), provided in Attachment J4. The report shall include as a minimum: (1) the nature of the problem; (2) how or

why the problem occurred; (3) the steps being taken to correct the problem (4) the consequences of the problem; and (5) actions to prevent similar occurrences.

C.7 PROGRESS REPORTS

The contractor shall submit written monthly progress and status reports due on first (1st) day of the month following contract award and thereafter on a calendar month basis. The progress report is to be submitted within 10 calendar days after the end of the calendar month. Four (4) copies shall be submitted, three (3) copies shall be provided to the COTR and one (1) copy to the Contracting Officer. The reports shall conform to the format and criteria listed in Contract Deliverable PM01 (Monthly Status Report), provided in Attachment J4.

C.8 MEETINGS

C.8.1 The contractor shall conduct monthly Task Order Status Reviews with the PTO COTR or his/her representative. Subjects for discussion at the meetings shall include at a minimum; but are not limited to:

- a. Work completed during the reporting period.
- b. Technical status report on all tasks.
- c. Financial status report on all tasks.
- d. Work schedule for the next reporting period.
- e. Identification of any problems or delays and recommendations as to their resolution with reference to the problem reports submitted in the interim.

The Contractor shall make available all technical personnel associated with the project work areas which are related to the topics that are listed in the proposed agenda.

C.8.2 Other meetings between the contractor and the PTO will be held on an "as required" basis during the performance of the contract. The majority of the meetings will be held at the U.S. Patent and Trademark Office, 2121 Crystal Drive (Crystal Park 2), Arlington, Virginia 22202; however, meetings may also be held at the contractor's facility when determined appropriate by the COTR. The contractor shall be able to attend any meeting called by the PTO when given a two hour advance notice of such a meeting. As requested, the Contractor shall prepare and submit written minutes of all meetings in accordance with the format and criteria contained in Contract Deliverable PM06, (Minutes of Meeting provided as Attachment J4.

C.9 QUALIFICATIONS OF CONTRACTOR PERSONNEL

C.9.1 Minimum education and experience requirements for each job

category are stated below (where applicable). Contractor may substitute years of equivalent experience in lieu of the education requirement, providing the experience requirement, as stated, has been fully met. However, a year of experience shall not simultaneously count toward meeting both the education and experience requirement.

C.9.2 As a group, excluding administrative/clerical support personnel, the contractor's proposed personnel shall possess a working knowledge of:

C.9.2.1 WordPerfect, Excel, Microsoft Word, Foxbase and/or dBase IV, Lotus 1-2-3, MacProject, MacDraw, Paradox, Filemaker Pro, and Microsoft Project.

C.9.2.2 Large mainframes (e.g. IBM, Unisys, Amdahl, etc.) and their associated operating systems; data base systems development and administration; and personal computers (e.g. IBM PC's, Macintosh, etc.) and their associated operating systems.

C.9.2.3 Programming languages (e.g. C, C++, UNIX, etc.).

C.9.3 PROGRAM MANAGER

C.9.3.1 Minimum Education Requirement: Bachelor's Degree in General Management Information Resource Management, Computer Science, Computer Design or related discipline.

C.9.3.2 The Program Manager shall have a minimum of 10 years of experience in data processing and telecommunications. A minimum of 5 of those years shall have be in a supervisory capacity over groups of three or more people, and at least 5 years of experience in managing multiple project groups is required.

C.9.3.3 The Program Manager shall have at least 5 years of experience in independent verification and validation, test and evaluation, and operations and maintenance; and at least 5 years of experience in Federal acquisition management, cost and schedule management, procurement management and logistics management. Experience shall include directing the implementation and maintenance of automated project planning programs.

C.9.3.4 The Program Manager shall have organized, coordinated and directed planning and implementation of contract support activities, and have demonstrated oral and written communication skills suitable for interfacing with all levels of management.

C.9.3.5 The Program Manager shall have demonstrated the ability to plan and implement projects in a cost-effective manner, and have a comprehensive knowledge of Federal contracting procedures.

C.9.3.6 The Program Manager shall have a comprehensive knowledge of Federal security laws, directives and guidelines as they pertain to

acquisition and development of information technology services.

C.9.4 SENIOR COMPUTER SYSTEMS SPECIALIST

C.9.4.1 Minimum Education Requirement: Bachelor's Degree in Computer Science or related discipline.

C.9.4.2 Each Senior Computer Systems Specialist shall have a minimum of 8 years of experience in data processing and telecommunications. A minimum of 3 of those years shall have included direct involvement in engineering, developing, testing and evaluating system design alternatives for major automated systems. Experience shall include a detailed working knowledge of automated project management systems and all aspects of system development life cycle (SDLC) methods. Each senior computer specialist shall have experience in relating and translating policy into operating procedures.

C.9.4.3 First-hand experience shall include directing technical studies, risk assessments, security sensitivity analyses, proof of concept studies, and testing. It shall also include development of automated system monitoring concepts, implementing and maintaining security awareness training plans, contingency and disaster recovery plans, certification schedules and requirements.

C.9.4.4 First-hand experience shall include the development and documentation of strategic and tactical level plans for major automation programs. Experience shall also include development of such plans responsive to higher (e.g., Departmental) level Information Resource Management (IRM) requirements. Each senior specialist shall have demonstrated the ability to support a major Government organization's decisions to design, develop, enhance, acquire and deploy large and complex application systems, involving hardware as well as software considerations.

C.9.4.5 At least one Senior Computer Systems Specialist shall have a comprehensive knowledge of configuration management and software quality assurance programs, as well as Federal security laws, directives, and guidelines. As a group (not each individual), they shall have first-hand experience in the Federal Government procurement process, in developing the technical portion of solicitation and tasking documents, as well as first-hand experience in evaluating the technical portion of offeror-submitted proposals and in technical assessment of other contractor-developed plans, documentation and work products.

C.9.4.6 As a group, they shall possess experience in verification and validation of system software, implementation and testing of computer centers, liaison with program management and contract groups, provision of engineering reference and project data libraries, and determination of security, quality assurance and configuration management policies.

C.9.5 SENIOR QUALITY ASSURANCE SPECIALIST

C.9.5.1 Minimum Education Requirements: Bachelor's Degree in Computer Science Computer Design, or related discipline.

C.9.5.2 Each Senior Quality Assurance (QA) Specialist shall have a minimum of five (5) years of first-hand experience and skills in the following subject areas.

C.9.5.3 Preparation and conduct of:

- o System Requirement Reviews (SRRs),
- o Preliminary Design Reviews (PDRs),
- o Critical Design Reviews (CDRs), and
- o Test Readiness Reviews (TRRs).

C.9.5.4 Experience and skills in developing QA related policies, standards, procedures and guidelines. Experience and skills shall also include the implementation and promulgation of such material within an organization.

C.9.5.5 Experience and skills in determining, developing and performing Quality Control (QC) procedures on work products resulting from the application systems development process; particularly those work products developed by software contractors. Experience and skills shall also include the use of industry-accepted QC procedures on ADP-related hardware as well as software.

C.9.5.6 Experience and skills in conducting audits of:

- o Functional processes such as software contractor's configuration management program, and
- o Development processes such as a Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).

C.9.5.7 Experience and skills in evaluating the quality of QC procedures used QC of automated data, and in assessing the effectiveness of data correction procedures. Experience and skills shall also include actually performing data quality assessment and data correction.

C.9.5.8 Experience and skills in the application of Quality Factors and METRICS Quality Measurement to assure the quality of newly developed software, and experience and skills in the automation of Quality Factors.

C.9.5.9 Experience and skills in CASE technology, and in both the evaluation a use of QA-based software products such as source code analyzers, code development and test tools, programming support tools and QA statistical packages.

C.9.5.10 Experience and skills in various industry-accepted testing processes and procedures such as System Development Testing (SDT),

System Acceptance Testing (SAT) and Regression Testing.

C.9.5.11 Experience and skills in Requirements Traceability through the entire SDLC process. Experience and skills shall also include a high level knowledge industry-accepted Configuration Management (CM) disciplines.

C.9.5.12 At least one Senior Quality Assurance Specialist shall have experience and skills in the use of DoD Std 2167/2167A (Software Life Cycle standard) and DoD Std 2168 (Software Quality Assurance Standard) or in the use of IEEE standards (Software Life Cycle standard). At least one Quality Assurance Analyst shall also have experience in establishing and promulgating the use of a SDLC methodology or major phases of an SDLC within an organization.

C.9.6 SENIOR CONFIGURATION MANAGEMENT SPECIALIST

C.9.6.1 Minimum Education Requirement: Bachelor's Degree in Computer Science, Computer Design, or related discipline.

C.9.6.2 Each Senior Configuration Management Specialist shall have a minimum of five (5) years of first-hand experience and skills in the following subject areas:

C.9.6.3 Experience and skills in the use of industry-accepted practices and procedures in Configuration Management (CM) for both hardware and software.

C.9.6.4 Experience and skills in establishing clustered and hierarchical Configuration Control Boards (CCBs). Experience and skills shall also include Change Control processes and procedures and Version/Release management of software in a production environment.

C.9.6.5 Experience and skills in developing and using naming conventions within the area of CM. Individuals shall also have experience and skills in the use of Data Element Dictionary (DED) processes.

C.9.6.6 Experience and skills in the identification and management of CM baselines to include Functional Baselines, Allocated Baselines, Beta Product Baselines and Product Baselines.

C.9.6.7 Experience and skills in both manual and automated status accounting systems for the accounting and reporting of change status.

C.9.6.8 Experience and skills in planning and conducting Functional Configuration Audits (FCAs) and Physical Configuration Audits (PCAs).

C.9.6.9 Experience and skills in the evaluation and use of automated CM tools for numerous components of hardware, software and documentation.

C.9.6.10 Experience and skills in Requirements Traceability through

the entire SDLC process. Experience and skills shall also include knowledge of industry-accepted Quality Assurance disciplines.

C.9.6.11 At least one Senior Configuration Management Specialist shall have experience and skills in defining, planning, developing, implementing and promulgating broad functional programs (e.g., an all encompassing Configuration Management program) throughout an entire data processing organization.

C.9.6.12 At least one Senior Configuration Management Specialist shall have experience and skills in the use of DoD Std 2167/2167A (Software Life Cycle standard), DoD Std 2168 (Software Quality Assurance standard) and 48x series. At least one Senior Configuration Management Specialist shall have experience in establishing and promulgating the use of CM practices and procedures in the major phases of the SDLC within an organization.

C.9.7 SENIOR TEST AND INTEGRATION SPECIALIST

C.9.7.1 Minimum Education Requirement: Bachelor's Degree in Computer Science or related discipline.

C.9.7.2 Each Senior Test and Integration Specialist shall have a minimum of eight (8) years of experience in writing detailed test procedures in accordance with either DoD-STD-2167A or IEEE standard.

C.9.7.3 Each Senior Test and Integration Specialist shall possess a minimum of five (5) years of expert, first-hand experience in the following: software development, installation and integration; system engineering; test and integration; programming languages and operating systems.

C.9.7.4 As a group, they shall have a working knowledge of desktop publishing tools and have experience in managing large, complex documentation projects.

C.9.8 SENIOR INFORMATION SYSTEMS SECURITY SPECIALIST

C.9.8.1 Minimum Education Requirement: Bachelor's Degree in Computer Science or related discipline.

C.9.8.2 Each Senior Information Systems Security Specialist shall have a minimum of eight (8) years of experience in data processing and data communications. A minimum of 3 of those years shall have included direct involvement in planning, engineering, developing, testing and evaluating information security system design alternatives for major automated systems. Experience shall include a detailed working knowledge of automated tools for risk analysis, contingency and disaster recovery planning, and project management, and all aspects of evolutionary system development life cycle methods. Each Senior Information Systems Security Specialist shall have experience in relating business and development environments to Government statutes, regulations, and laws, creating policies for these environments, and in