

MINOR CHANGE REQUEST FORM

MCR NO. **MCR-QA-028,R1-001**

(e.g., MCR-ENG-021,R0-001)

The Minor Change Request (MCR) Form is to be used to process Minor, or in some necessary cases, Urgent or Temporary changes to PPPL Lab-wide procedures). The MCR should be used when changes are:

- 1) **minor** and do not warrant further SME review;
- 2) **urgent** and cannot wait the 2-4 week period for further SME review; or
- 3) **temporary**, to revert to original state by a given expiration date (must be within 6 months).

For questions about definitions of “minor,” “urgent,” and “temporary” changes, please review Lab-wide Procedure GEN-001, **Development, Review, and Approval of Lab-wide Documents**.

Person Requesting Change: Marc Cohen Phone Ext: 3404

Department Name: Information Technology Department

Document Number: QA-028 Revision No.: 1

Document Title: Software Quality Assurance

Reason for change:

Clarifying guidance for SQA Description and Categorization Form

Change description: The existing procedure has the SQA Description and Categorization Form as Attachment 1. This form was tweaked to provide additional clarification/guidance on how the form is to be completed. The new form has also been removed as an attachment from the procedure and will be available on the web at (once the revised procedure is posted):

https://ppplprod.service-now.com/kb_view.do?sysparm_article=KB0010825

The revised procedure and form are attached.

1. Does this change significantly alter the intent or scope of the document? **YES:** **NO:** X

2. Does this change significantly impact ES&H? **YES:** **NO:** X

If 1 or 2 is **YES**, explain why the changes should not be submitted as a revision:

Place a check mark next to the appropriate type of change request:

- Minor change? X
- Urgent change? (revision must follow within 2 weeks)
- Temporary change?

If “temporary change” is checked, provide expiration date, allowing document to revert to original state (must be within 6 months):

Management System Owner/Designee Approval

Date

Head, PACM/Designee

Date

Release/Effective date of this MCR: 1/6/20

PPPL	PRINCETON PLASMA PHYSICS LABORATORY	PROCEDURE	No. QA-028 Rev 1 page 1 of 15
Subject: Software Quality Assurance	Effective Date: 1/22/19	Initiated by: Head, IT Department (CIO)	
	Supersedes: R0, dated 9/28/18	Approved: Deputy Director for Operations	

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Management System (Primary): 06.00 Information Technology
Management System Owner: Head, Information Technology (CIO)
Management Process: 06.03 Software Quality Assurance
Process Owner: Head, Information Technology (CIO)
Subject Matter Expert (SME): Head, Information Technology

APPLICABILITY

This procedure defines the process to follow to procure, develop, change, test, use, and/or retire software (SW) at Princeton Plasma Physics Laboratory (PPPL). It implements the PPPL Graded Approach, which requires different levels of documentation and approval according to risk categorization. Only approved software shall be procured, developed, or used at PPPL. This procedure implements the requirements of the PPPL Quality Assurance Program Description (QAPD) and delineates the steps, requirements, and documentation necessary to develop and approve software procurement or development, and to make necessary updates or changes.

PPPL does not produce or use safety software for, or in support of, onsite nuclear facility operations as defined in US Department of Energy (DOE) Order O 414.1D. In cases where the Laboratory produces software that may be used as safety software at external facilities, that software will be developed, used, and tested by the standards and controls prescribed by the external organization. In these cases, a specific Quality Assurance Plan (QAP) might need to be developed to further describe the software quality assurance (SQA) requirements.

This procedure does not address the process of making changes to software requirements or specifications.

This procedure does not address the process of making changes to technical procedures.

INTRODUCTION

Software used at PPPL for the design, analysis, control, and operation of research experiments and Laboratory infrastructure shall be managed as described herein. Software that does not meet this criteria shall default to a categorization of A3 and requires no additional action. The controls in this document represent the minimum requirements for managing software; additional controls can be added as desired. This includes software that is:

- procured from an established software supplier
- developed via contracted services or through collaborations
- developed by individuals at PPPL (regardless of whether the software is intended for use at PPPL or furnished to collaborators)

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When Memorandum of Understanding (MOUs), collaboration agreements, project plans or Strategic Partnership Projects (SPPs) define alternative SQA requirements that are more stringent than those defined herein, PPPL shall follow the alternative requirements (QAPD Section 5.12.1).

The PPPL Information Technology (IT) Department in conjunction with the Quality Assurance (QA) Department is responsible for management and oversight of the SQA Program and this procedure. The PPPL IT Department shall maintain an inventory of the PPPL software under SQA per this procedure. At a minimum, the inventory entries shall include the software description, software name, version identifier, SQA categorization (per the PPPL QAPD Table 1 PPPL Graded Approach Matrix – Services and Items), summary description of software application, compiler information (for in-house developed software, only) and the PPPL owner. Additional SQA information and documentation will be maintained as described in the procedure steps.

Software that is categorized at the A-1 or A-2 quality levels (per the PPPL QAPD Table 1) shall be tested in a non-operations test environment when practical, but in all cases, A-1 and A-2 software shall be tested prior to use.

Deviations from these requirements are documented in QA-005 “Control of Nonconformances” and dispositioned accordingly.

REFERENCES

QAPD	Quality Assurance Program Description
ENG-032	Work Planning Procedure
ENG-033	Design Verification
ENG-057	Project and Governance Roles and Responsibilities
GEN-023	Records Management
QA-005	Control of Non-conformances
TR-001	Laboratory Training Program
PPPM 2-30	Procurement Policies and Procedures Manual (PPPM), Procurement of Information Technology
QA-012	Corrective Action Request
P-072	Procurement Assurance (ES&H, Quality and Technical Requirements)
P-088	Computer Use and Use of Social Media
P-094	Cyber Security Policy
P-095	Protection of Personally Identifiable Information (PII)
DOE O 414.1D	Quality Assurance
DOE G 414.1-4	Safety Software Guide for Use with 10CFR830, Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance

DEFINITIONS

Acceptance Testing: The process of exercising or evaluating a system or system component by manual or automated means to ensure that it satisfies the specified requirements and to identify differences between expected and actual results in the operating environment.

COTS/GOTS:	Commercial Off-the-Shelf/Government Off-the-Shelf software readily available (usually procured/sourced as opposed to developed), which has a variety of built-in functions that allow a user to customize the application and organize, manipulate, report, and manage data sets.
Configuration Management:	The process of identifying and defining the configuration items in a system (i.e., software and hardware), controlling the release and change of these items throughout the system's lifecycle, and recording and reporting the status of configuration items and change requests.
Design Description:	Defines how the software product is organizationally structured to satisfy the requirements identified in the Software Requirements phase. The software design is a detailed description of the software configuration, components, interfaces, functional security requirements, and data design information necessary for developing the software.
Functional Requirements Description:	Defines and documents the user requirements and operational characteristics for each system. It details user inputs, outputs, interfaces, and processing logic in a readable manner to facilitate common understanding of the software.
Legacy Software:	Software deployed and in use at PPPL prior to the issuance of this procedure.
Requirement:	A condition or capability that must be met or possessed by a software to satisfy a standard, specification, formally imposed document, or needed by a user to solve a problem or achieve an objective.
Requirements Specification:	Defines and documents the software requirements including customer, user, interface, performance, test, cyber-security, platform and installation including necessary constraints and assumptions to facilitate design or procurement of a software item.
Research Software:	Software used to: <ul style="list-style-type: none">• Gain knowledge from basic or applied research• Reproduce research results• Provide a research deliverable, useful materials, devices, systems, or methods• Developed and delivered to a customer (for research purposes)
Retirement:	The act of retiring a software item from use including removal of software from active systems, operation, or user access.
Software:	Computer programs, procedures, and associated documentation and

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data pertaining to the operation of a computer system. In terms of this procedure, software includes software applications, firmware, process-control devices, and embedded macros that perform calculations and data manipulation not independently verified on each use.

- Software Lifecycle:** The activities that comprise the evolution of software from conception to retirement. The software lifecycle typically includes the software development life cycle (SDLC) and the activities associated with operation, maintenance, and retirement.
- Source Code:** Computer instructions and data definitions expressed in a form suitable for input to an assembler, compiler, or other translator.
- Validation:** The process of (a) evaluating a system or component during, or at the end of the development process to determine whether it satisfies specified requirements; or (b) providing evidence that the software, and its associated products, satisfies system requirements allocated to software at the end of each lifecycle activity, solves the right problem (e.g., correctly models physical laws, implements business rules, uses the proper system assumptions), and satisfies the intended use and user needs.
- Verification:** The process of (a) evaluating a system or component to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase; or (b) providing objective evidence that the software and its associated products conform to requirements (e.g., for correctness, completeness, consistency, accuracy) for all lifecycle activities during each lifecycle process (e.g., acquisition, supply, development, operation, and maintenance); satisfies standards, practices, and conventions during lifecycle processes; and successfully completes each lifecycle activity and satisfies all the criteria for initiating succeeding lifecycle activities (e.g., building the software correctly).

General Requirements for Software

Software used at PPPL is required to be evaluated according to the PPPL Software QA Requirements Matrix (see PPPL QAPD, Table 2) to determine the level of documentation and approval to develop, procure, and/or use the software under the PPPL QAPD. Software owners, in conjunction with the Chief Information Officer's (CIO) office, are responsible for assuring the software is appropriately evaluated, classified, and documented on a graded approach depending on the potential impact to safety and risk. This procedure outlines the minimum necessary steps to develop and approve software life-cycle phases to implement the SQA program as defined in the QAPD.

Roles and Responsibilities

Chief Information Officer (CIO) – Overall responsibility/ownership for the SQA Program including software categorization, inventory, cyber-security, periodic assessment, and related procedures. Reviews

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and approves SQA life-cycle documentation not used or related to experiments or experimental systems and final documentation for release and install of software items.

SQA Inventory Lead – Responsible for software library including application and data inventory, version control, and related software documentation.

Application Owner (AO) – Responsible for implementing the SQA requirements, categorization, documentation, verification, and acquiring required approvals for software items under their control, development and/or procurement. Reviews for completeness and submits approved SQA documentation to records per applicable procedure(s).

Chief Engineer (CE) – Reviews and approves software documentation used or related to experiments or experimental systems.

Technical Authority (TA) – Responsible for approving software categorization for software used or related to experiments or experimental systems, software changes, validation and verification (V&V) and corrective action approvals.

Responsible Engineer (RE) – Responsible for categorizing software used on experiments or experimental systems and obtaining approval from TA

Project Manager (PM) – Responsible (as assigned) for review and approval of Software Project Management Plans and related documentation.

Department Head (DH) – Responsible for software items used, developed, and/or procured within their organization including implementing appropriate controls, documentation, and approvals.

Records Coordinator – Responsible for review of SQA-generated records and potential software application records generation and retention schedule during software development and testing.

Procurement Specialist – Responsible for software procurement and sourcing of externally developed COTS and/or GOTs to ensure all procurement requirements are met.

Quality Assurance/Control (QA/QC) – Responsible for independent oversight of SQA program and verification of corrective actions for Level A-1/2 software defects.

PROCEDURE

This procedure is divided into six (6) sections as follows.

- Part A – Software Categorization and Inventory
 - Part B – Software Quality Assurance
 - Part C – Legacy Software
 - Part D – SQA Oversight
 - Part E – SQA Training
 - Part F – SQA Records Requirements Specific to this Procedure
- Attachments/Forms

A. Software Categorization and Inventory

Software used at PPPL is evaluated for categorization according to a graded risk-based approach to determine the level of software review, approval, and documentation per QAPD, PPPL Software QA Requirements.

Software is categorized by RE and approved by TA for software used or related to experiments or experimental systems. For other software, software is categorized by acquiring DH and approved by CIO.

The CIO is responsible for maintaining the PPPL software inventory including required configuration management data. The SQA Inventory Lead, in conjunction with the AO, is responsible for maintaining the inventory list of all software items and documentation required to be maintained as part of this procedure.

At a minimum, all software items shall include the following information in the inventory:

- software description,
- software name,
- version identifier,
- SQA Categorization (i.e., A-1, A-2, or A-3),
- summary description of software application,
- source code/compiler information (for in-house developed software only),
- and the PPPL owner.

Additional information may be required based on the SQA categorization and levels of detail of the required approvals and documentation including referenced storage locations of the approved documents described in the SQA requirements outlined in this procedure.

RESPONSIBILITY**ACTION**

RE/DH

1. In conjunction with AO (if different), compares software item to QAPD Table 1, PPPL Requirements Graded Approach Matrix, to determine Categorization Level and completes required information using the SQA Software Description and Categorization Form available at PPPL's Service Now website:
https://ppplprod.service-now.com/kb_view.do?sysparm_article=KB0010825.
When considering cost, software is graded only against the license cost. Software subscriptions shall be evaluated based on the annual cost. **MCR-QA-028,R1-001**

TA /CIO

2. Reviews and approves SQA Categorization and Inventory Form to allow start of process.
3. Forward approved form to Software Inventory Lead for processing.

SQA Inventory
Lead

4. Reviews SQA form and enters information in SQA Inventory List.
5. Informs AO that the software life-cycle phase can begin under configuration management, as applicable.

B. Software Quality Assurance

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Software Quality Assurance (SQA) is required for all PPPL software items designated as Level A-1/2. SQA starts at initial documentation of the project plan continuing through detailing the functional requirements through design, implementation, testing, and ends at the retirement and removal of the software from PPPL systems. The level of documentation and approvals throughout the process depends on the designated categorization and graded approach levels determined in Section A, above. Verification of each of the software phases is performed on Level A-1/2 software to ensure compliance. Higher software risk requires more detailed review, documentation, and approval levels per the following procedure steps. The following software life-cycle steps are performed as part of the SQA process and can be implemented in conjunction with other PPPL process controls including work planning, design review, and test planning processes according to the respective organizational requirements and software categorization level.

The following phase steps are aligned in the usual order of performance, but can be performed in parallel, as necessary, to complete the process and allow updates to previous phase documentation.

1. Software Project Management –Level A-1 and A-2 software requires a Software Project Management Plan (PMP) approved by the PM (if assigned) or the DH. Project planning ensures appropriate scope, cost, schedule and resources are available to successfully implement the SQA program for each software item. The following elements shall be considered in the Software Project Management Plan:

- a. Introduction
 - i. Project Background
- b. Project Baseline
 - i. Scope of Baseline
 - ii. Basis of Estimate
- c. Acquisition Approach
 - i. Acquisition Strategy
 - ii. Offeror Selection Process
 - iii. Evaluation Criteria
- d. Management Structure and Project Team
- e. Quality Assurance, Testing and Evaluation
- f. Communications Strategy
- g. Transition to Operations
- h. Project Closeout
- i. Summary Schedule

RESPONSIBILITY ACTION

- | | |
|-------|---|
| AO | <ol style="list-style-type: none"> 1. Assure completion Project Management Plan, including applicable criteria described above. 2. Forward PMP for required review and approvals. |
| PM/DH | <ol style="list-style-type: none"> 3. Review and approve the Level A-1/2 Project Management Plan, if applicable. |

2. Configuration Management – The AO is required to implement software configuration

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management beginning at initial development/procurement including version control and software changes for the history of the software. Software changes to Level A-1/2 software items require TA approval and testing prior to use. The following elements are to be addressed as part of Configuration Management:

- a. Listing of each configuration management item (e.g. source code, documentation, test data, training materials, installation media, etc.)
- b. Location/Source of each configuration management item
- c. Configuration Identifier methods for initial and Major/Minor Revisions
- d. Description of the Change Control process
- e. Description of how emergency updates are handled
- f. Configuration status accounting (for in house developed code only)

RESPONSIBILITY**ACTION**

AO

1. Provide initial Configuration Management inputs if new software or updates if changes to existing software items.
2. Configuration Management criteria are provided as part of the initial Software Categorization and Inventory Form and shall be evaluated and updated if software changes require.

TA

3. Review and approve software changes, if applicable, the SQA Software Description and Categorization Form and proceed to the Requirement Specification phase.

3. Requirements Specification – Software Requirements Specifications are required for Level A-1/2 software items with approval by the CE for software used or related to experiments or experimental systems. The CIO approves all other software (e.g., Laboratory infrastructure). Though not required, brief requirements specifications are suggested for Level A-3 software items to ensure developers and procurement personnel understand the needs of the organization. The following elements are to be addressed in the Requirements Specifications, as applicable:

- a. Customer Requirements
- b. Functional Requirements Description
- c. Major Interfaces
- d. Software Constraints
- e. Assumptions
- f. Platform/OS
- g. Inputs/Outputs
- h. Installation/User
- i. Design Inputs/Constraints
- j. Error Recovery/Backup & Reporting/Logging
- k. Records Generation & Repository
- l. Cyber-Security/User Controls
- m. Data Management
- n. User and Installation Documentation
- o. Record Generation

RESPONSIBILITY ACTION

- | | |
|--------|---|
| AO | 1. Completes and forwards Requirements Specification (if required) for required review and approvals. |
| CE/CIO | 2. Reviews and approves the Level A-1/2 Requirements Specification, if applicable, and forwards to the CIO's Office for Inventory listing update. |

4. Design Description (if applicable) – A Software Design Description is required for all internally or externally developed Level A–1 software items and should be considered for Level A-2/3 software items. Design details would not be expected for COTS/GOTs software items and as such are not required. Approvals of the Design Description are required by the CE for software used or related to experiments or experimental systems. The CIO approves all other software (e.g. business systems). The following elements are to be addressed as part of the Design Description, as applicable:

- a. Implementation of the requirements from the Requirements Specification
- b. User Interface
- c. How addressed numerical, mathematical and/or physical models
- d. Control, logic, data and process flow
- e. Data structure and relations
- f. Defects, Hazards and Anomalies
- g. Cyber-Security Protocols
- h. Provide enough details for successful implementation

Additional information may be required to complete the Design Phase based on the type and scope of the software development and client requirements. In addition to the above reviews, Design and/or Peer reviews may also be necessary to complete this phase (as determined by the CE or CIO). Additionally, previous documentation must be evaluated and updated, as necessary, with any changes initiated from the design phase.

RESPONSIBILITY ACTION

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|--------|--|
| AO | 1. In conjunction with the software developer, Completes Design Description (if required) and forwards for required review and approvals. |
| CE/CIO | 2. Reviews and approves the Level A-1/2 Design Description, if applicable, and forward to the CIO's Office for update to the Software Inventory Listing. |

5. User Documentation– User documentation and installation instructions are required for all Level A-1/2 software items and are recommended for all other software items. For procured software, a user manual (physical or electronic) shall be included in the requirements and procurement criteria. Additional user and installation instructions might need to be developed by the AO to supplement that provided by the external developer/source. Approval of the user documentation is required by

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the CE for software used or related to experiments or experimental systems. The CIO approves all other software (e.g., business systems). The following elements shall be addressed as part of the User Documentation, as applicable:

- a. Description of User Functions and operation
- b. Installation Instructions
- c. Limitations/Constraints of use

RESPONSIBILITY**ACTION**

AO

1. Secures from Vendor and/or completes User Documentation and Installation Instructions (if required) and forwards for required review and approvals.

CE/CIO

2. Review and approve the Level A-1/2 User Documentation, if applicable, and forward to the CIO's Office for Inventory Listing updates.

6. Test Documentation and Verification & Validation (V&V) – A-1 and A-2 Software shall be tested in a non-operations test environment when practical, but in all cases, shall be tested prior to use. When the A1/2 software is being used to control experiments or infrastructure, a separate development and or test environment shall be required. Software Test Documentation is required for A-1 and V&V is required for Level A-1/2 software items. The V&V testing phase includes integration testing, acceptance testing, and independent validation, as applicable. Approvals are required by the CE for software used or related to experiments or experimental systems. The CIO approves all other software (e.g., business systems). The following elements shall be included in the software test plan and/or V&V documentation, as applicable:

- a. Verification of Level A-1/2 Requirements and Design Description by someone independent of the development.
- b. Source Code implemented the requirements and design elements.
- c. Integration Testing – validates the design requirements and interfaces
- d. Acceptance Testing – validates that all requirements have been implemented
- e. Installation Testing – validates the installation instructions and data set(s)
- f. Cyber-Security/Access Control Testing – Validates user controls and other cyber-security requirements have been implemented
- g. Error Reporting/Logging – validates error recovery and reporting

Additional information may be necessary to complete the test documentation and V&V phase including test error fixes/retesting and updates to previous SQA Documentation if changes are made as a result of the testing phase.

RESPONSIBILITY**ACTION**

AO/Tester/Developer

1. Completes initial Software Test Documentation (if required)
2. Performs the V&V Testing (if required) and completes required information on the Test Documentation

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3. Forwards completed Testing Documentation and SQA Form(s) for required review and approvals.

CE/CIO

4. Reviews and approves the Level A-1 Test Documentation and V&V Testing completion, if applicable, and forwards to the CIO's Office Software Inventory Listing updates.

7. Software Defect Reporting, Tracking Categorization and Corrective Action - The AO is responsible for assuring proper documentation and resolution of software issues/bugs and reporting through the applicable corrective action program. Software issues/bugs shall each be categorized into one of the following groups:

Critical: The defect affects critical functionality or critical data. It does not have a workaround. Example: Unsuccessful installation, complete failure of a feature.

Major: The defect affects major functionality or major data. It has a workaround but is not obvious and is difficult. Example: A feature is not functional from one module but the task is doable if 10 complicated indirect steps are followed in another module/s.

Minor: The defect affects minor functionality or non-critical data. It has an easy workaround. Example: A minor feature that is not functional in one module but the same task is easily doable from another module.

Trivial: The defect does not affect functionality or data. It does not even need a workaround. It does not impact productivity or efficiency. It is merely an inconvenience. Example: Petty layout discrepancies, spelling/grammatical errors.

Defect Reporting, Tracking, and Categorization are required for Level A-1/2 software. In addition, Corrective Actions, approved by QA/QC, are required for Critical and Major issues/bugs.

Corrective Action closure is approved by TA for software used or related to experiments or experimental systems. All other software Corrective Actions are approved by CIO. QA/QC shall verify closeout of A-1 and A-2 software defects.

RESPONSIBILITY**ACTION**

AO

1. Documents and fixes reported software defects/bugs and, as applicable, reports issues through the appropriate non-conformance and/or corrective action program (required for A-1/2 software items).

QA/QC

2. Approves corrective action

TA/CIO

3. Reviews and approves corrective actions for software, as applicable.

QA/QC

4. Verifies closeout of A-1 and A-2 corrective actions.

Additional SQA requirements may need to be addressed as follows:

- 8. Procurement (if applicable)** – If software item is being procured for external development or is a COTS/GOTS, a procurement specialist (and QA/QC may be required to review and concur with the Statement of Work and specifications prior to release (per Procurement Policies and Procedures Manual [PPPM] 2-30, Procurement of Information Technology and P-072).

RESPONSIBILITY

ACTION

AO

1. Works with Procurement personnel to ensure requisite documentation, criteria, and approvals are in place prior to purchase, as applicable.
2. Forwards procurement documentation for required review and approval.

Procurement
Specialist/QA/QC

3. Reviews and approves the software and procurement documentation, if applicable, per the associated procedures.

- 9. Application User Training** – The need for training to install, operate, and/or administer the software application shall be evaluated per PPPL Procedure, TR-001, Training, For Level A-1/2 software items, the training materials shall fall under Configuration Management per reference in Section 5 above.

RESPONSIBILITY

ACTION

AO & Training
Specialist

1. Evaluates the need for Application User Training per PPPL Training procedure (TR-001) for all A-1/2 software items.
2. Develops and implements Application User Training (if applicable) and forwards to CIO's office for update to Inventory Listing.

SQA Inventory
Lead/CIO

3. Updates the SQA inventory and repository with information provided by AO.

- 10. Application Records** – Potential records generated by the software shall be evaluated per PPPL Records Procedure GEN-023 to ensure appropriate records retention and schedule. If records are electronically generated from the software, the AO must ensure this is captured in the requirements, design and/or test documentation, as applicable.

RESPONSIBILITY

ACTION

AO

1. Identifies potential software generated records (if applicable).
2. If records are generated, works with the PPPL's Quality Assurance Department to ensure proper format, interface, and retention are built into the software requirements, design, and testing documentation, as applicable.
3. Submits final approved SQA Documentation to records per PPPL Procedure GEN-023.

11. Maintenance & Updates – All active software items under SQA must be periodically reviewed to ensure all aspects of SQA are up-to-date and correct. A-1 software items shall be reviewed annually, with all other software items reviewed as a minimum every three (3) years. If updates to documentation and/or the software item are required, the software shall be reviewed according to this procedure and updated accordingly. Vendor maintenance support and license renewal must also be managed by the AO in conjunction with the CIO and Procurement office, as applicable. Software no longer needed at PPPL shall be evaluated for potential retirement and removal from PPPL systems. The following elements are to be addressed as part of the periodic reviews, as applicable:

- a. Periodic Maintenance and/or License Review
- b. Dates of previous and next scheduled review
- c. Periodic Update Control & Process
- d. Maintenance and/or License updates required?
- e. Are internal developers available to continue maintenance of internally developed software?
- f. Future need for software and potential retirement.

RESPONSIBILITY

ACTION

AO

1. Completes periodic software review (if required) and required information on Attachment 1, the SQA Periodic Review Form.
2. If changes/updates are required to the form and/or software, updates the required form(s) and forwards for required review and approvals.

CE/CIO

3. Reviews and approves the periodic software review, if applicable, per Attachment 1, the SQA Periodic Review Form.

Software Inventory
Lead

4. Updates the SQA inventory and repository with information provided by AO and submits review form to records per GEN-023.

C. Legacy Software

Legacy software, as defined in this procedure, shall be categorized according to **A. Software Categorization Inventory** above and subject to the following SQA controls:

Configuration Management

Test Documentation and V&V

Software Defect Reporting, Tracking Categorization and Corrective Action

When major changes to the software become necessary, the software shall be brought into full compliance with this procedure.

D. SQA Oversight

The CIO is responsible for overall SQA Program line ownership, oversight, and implementation of the ten QA criteria outlined in DOE Order O 414.1D. The Head, Quality Assurance is responsible for the independent oversight and assessment of the SQA Program/Procedures.

RESPONSIBILITY

ACTION

- | | |
|-------------------------|---|
| CIO | 1. Performs periodic review and management assessments of SQA Program, Procedure and related software inventory to ensure compliance to this procedure and applicable DOE Requirements, as a minimum every three years. |
| Head, Quality Assurance | 2. Schedules and performs periodic SQA independent assessments/audits to ensure compliance and performance according to QA requirements. |

E. SQA Training

The CIO is responsible for identifying and developing the required training for SQA performers including developers, V&V testers, owners, staff, reviewers and approvers per the PPPL Training Procedure TR-001.

RESPONSIBILITY

ACTION

- | | |
|-----|---|
| CIO | <p>1. Specifies the appropriate SQA training methods and means (below) and obtains concurrence of the Management System Owner and the Management Process Owner.</p> <p>2. Develops and provides required Training per TR-001 or applicable procedures.</p> <p style="margin-left: 40px;">a. Target Audience: Application Owners, SQA Approvers, CIO
Department Staff</p> <p style="margin-left: 40px;">Instructor: Head, IT Department (CIO)</p> <p style="margin-left: 40px;">Training Method / Frequency: Prior to performing SQA tasks
 <input checked="" type="checkbox"/> Briefings (major re-issue, new positions)
 <input checked="" type="checkbox"/> Email distribution (minor revisions)</p> <p style="margin-left: 40px;">b. Target Audience: <u>V&V Testers/SW Developers</u></p> <p style="margin-left: 40px;">Instructor: CIO</p> <p style="margin-left: 40px;">Training Method/Frequency: Prior to performing SQA tasks
 <input checked="" type="checkbox"/> Briefings (major re-issue, new positions)
 <input checked="" type="checkbox"/> Email distribution (minor revisions)</p> |
|-----|---|

F. Records Requirements Specific To This Procedure

Records Custodians must ensure records are maintained per PPPL Records Procedure GEN-023, as follows:

Record Title	Record Custodian	Location	Retention Time
Completed SQA Forms	CIO	Electronic Document Management System	Minimum of one (1) year after software is retired <i>GRS A20 (10.1.a)</i>
SW Life-cycle Documentation	CIO	Electronic Document Management System	Minimum of five (5) years after software is retired <i>GRS A20 (10.1.a) / 3.1 (011)</i>
SQA Inventory List	SQA Inventory Lead	Electronic Document Management System	Software titles shall be maintained on the list for a minimum of five (5) years after retirement <i>GRS A20 (10.1.a) / 3.1 (011)</i>

ATTACHMENTS:

1. SQA Periodic Review Form
2. SQA Process Flow Chart

1. **Instructions:** Complete this form according to QA-028, Software Quality Assurance. All fields are required and where appropriate, indicate “Not Applicable” with a “N/A”. Any required fields that are not applicable, shall include a justification/explanation.
2. **Application Information:**
 - a. Application Name: _____ Acronym: _____
 - b. Application Owner: _____
 - c. Application Owning Department/Project: _____
 - d. Unique Identifier (if applicable): _____
 - e. Application Use Case: _____
 - f. SQA Classification: A-1 _____ A-2 _____ A-3 _____ (SQA not required for A-3)
 - g. Software Review Cycle (minimum 3 year): _____
 - h. Software Last Reviewed/Updated: _____
3. **Periodic Review:** Provide required information to ensure software and associated documentation is up to date (if “Yes” to any questions, provide details in the Comments section, “Yes” answers may require updates to the software or documentation under SQA):

#	Periodic Review Criteria (to be completed by AO):	Yes	No	N/A
1	Is SQA Documentation in need of update?			
2	Are there any outstanding software defects that have not been fixed?			
3	Is there a newer version of the software available/needed?			
4	Are maintenance agreements in need of updates?			
5	Does the current SQA Level Classification need to be changed? (A-1, A-2, A-3)			
6	Were any errors identified during the testing? If so, were they addressed and retested? Was the documentation updated?			
7	Is the software ready for retirement, no longer needed? (if Yes, no longer needed, proceed to Software Retirement Section Below)?			
8	Has anything changed with the cybersecurity needs/requirements?			
9	Comments/Justification:			

4. **Software Retirement:** If Question # 7, above is “NO”, the software is no longer needed and ready for retirement, complete the following section: This is a required document for an internally or externally developed A-1/2 software items (per a graded approach). The following are to be reviewed as a minimum:
 - a. Planned Retirement Date: _____
 - b. Reason for Retirement: _____

#	Retirement Questions (to be completed by AO)	Yes	No	N/A
1	Does Application contain Record Data?			
2	If contains Record Data, have the records been submitted per PPPL Procedure ???			

3	What is the Records Retention Schedule?			
4	Does the Application Interface with any other system or application?			
5	Have interfaces with other systems been dispositioned? (If so, provide details below)			
6	Have application Users been notified?			
7	Are there any written agreements associated with Application (e.g. contracts, license/maintenance agreements, subscriptions, etc.)?			
8	If so, have they been dispositioned (provide details in Comments section)			
9	Comments/Justification for Retirement:			

Approvals (approval indicates software is ready to be retired from use at PPPL)

AO Name: _____

Signature _____ Date: _____

CE Name: _____

Signature _____ Date: _____

CIO Name: _____

Signature _____ Date: _____





