# SOFTWARE QUALITY ASSURANCE PROGRAM

## 1.0 PURPOSE

The purpose of this procedure is to establish and implement a Software Quality Assurance Plan to assure that software is controlled and complies with the intent of DOD-STD-2168 requirements.

## 2.0 SCOPE

Non-Deliverable software used in the manufacturing of deliverable hardware or in the qualification or acceptance of deliverable hardware.

## 3.0 APPLICABLE DOCUMENTS

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| | DOD-STD-2l68 | Software Quality Assurance Program Requirements |
| | SOP 52-10-008.0-00-002 | Process Parameters For Argo-Tech Nitriding Furnaces |
| | SOP 52-10-021.0-00-001 | SQA Plan for for Automated Test Systems |
| | SOP 52-10-021.0-00-003 | SQA Plan for Numerical Control Part Programs |
| | SOP 52-10-021.0-00-004 | SQA Plan for Manufacturing Engineering CAD Drawings |
| | SOP 52-10-021.0-00-005 | SQA Plan for Computer Aided Inspection |
| | SOP 52-10-021.0-00-006 | SQA Procedure For Computer-Aided Inspection M&M Gear Checker. |
| | ASQR-01 | Aerospace Supplier Quality Requirements |
| ϕ | ASQR-07.5 | Control of Software |

## 4.0 DEFINITIONS

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| Automated Test Systems | The application of computer hardware/software to automatically run tests on deliverable product. |

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| CAD | Computer Aided Design is the direct application of specialized computer hardware or software product operations such as, but not limited to design layout. |
| CAM | Computer Aided Manufacturing is the direct application of specialized computer hardware or software to manufacturing operations such as but not limited to numerically controlled machines. |
| CAI | Computer Aided Inspection is the direct application of specialized computer hardware or software to inspection operations such as, but not limited to coordinate measuring equipment. |
| Computer Program | A series of instructions or statements in a form acceptable to computer equipment, designed to cause the computer equipment to execute an operation or series of operations. |
| Software | A collection of associated computer programs and computer data required to enable the computer equipment to perform control or computational functions. (The abstract contents of tapes, disks, card decks, and firmware). |
| SQA | Software Quality Assurance, or the discipline that is used to assure that quality is built into the design, development, and production use of software. |
| SQAP | Software Quality Assurance Plan |

## 5.0 SOFTWARE QUALITY ASSURANCE PROCEDURES

5.1 Functional Departments which utilize software in the manufacturing of deliverable hardware or in the qualification or acceptance of deliverable hardware are responsible for the procedures which implement the controls for Software Quality Assurance (SQA) as defined in paragraph 5.2. Procedure responsibility includes:

A. Initiating detailed SQAP’s in the form of Standard Operating Procedures (SOP) to use in performing their assigned tasks.

B. Reviewing and updating their SOP’s to reflect changing working conditions and new requirements.

C. Submitting new and revised SOP’s to Quality Assurance for review and approval prior to release.

5.2 SOPs used in the defining of software quality assurance shall address the following:

A. Define the purpose of the software and how software requirements are initiated, documented, and approved.

B. Identify naming conventions (coding guidelines) and approval required for release to testing.

- Procedures shall detail the testing methods (first piece inspection, SPC limits, independent method of validation, etc.).

C. Define the process used to ensure requirements are met. Ensure software cannot be modified without authorization.

- Procedures must define temporary overrides (i.e. speeds, feeds, cutter size adjustments, etc.).

D. Define the process and approval required for the release of software for use.

- Provide objective evidence that software performs as required prior to use.
- Review and approval shall be performed by someone other than the software originator.
- Part specific software used to verify quantitative values requires an independent method of validation.

E. Define the process required to control software and related documentation, including revisions and identification for traceability purposes.

- Procedures must assure that the various versions of a program are uniquely identified and that only the current approved version is placed in production.
- Procedures shall require identification of the individual making a revision and a description of the nature of the change.

F. Define the process used to:

- Accept software into various libraries;
- Control access;
- Provide for backup and recovery;
- Ensure master versions are kept in a secure location.

G. Identify the method for storage, handling and release of software to user.

## 6.0 SUBCONTRACTOR CONTROL

6.1 It is the responsibility of the Supplier Quality Assurance Department to monitor Argo-Tech's subcontractors for their usage of software related to the design, manufacturing, inspection and/or test of deliverable articles. They will assure that software requirements are flowed down to subcontractors, as applicable.

6.2 Procedures should be developed to ensure this control, including the requirement for the subcontractor to develop a Software Quality Assurance Plan (SQAP). This Plan shall address areas identified in this document, as applicable.

6.3 Subcontractor control shall be invoked thru the Purchase Order and the Vendor Quality Requirements (VQR).

## 7.0 CORRECTIVE ACTION

7.1 Problems identified during software development, testing, acceptance, or problems with software based causes are analyzed and corrected through Argo-Tech’s corrective/ preventive action system described in QCP 12.0.

## ϕ8.0 SOFTWARE RETENTION

In order to ensure retrievability of non-deliverable software used in the manufacture of deliverable hardware identified in section 3.0 the user shall at a minimum retain prior revisions for a minimum of 10 years. Storage may be in the following formats:

1. Electronic
2. Hardcopy