

Seaport-e Quality Assurance System

Elements of the Quality Assurance System

Art Anderson Associates has developed a Quality Assurance System based on the key elements of the ISO 9001 (series) Model for Quality Assurance. This model is focused on demonstrating a supplier, in contractual situations, can design, produce and deliver the required services or products. Through Art Anderson Associates' implementation of our Quality Assurance System, we can ensure our clients will receive the highest level of quality deliverables and oversight on any contract. The key elements of our Quality Assurance System are:

- Define and document a quality control procedure.
- Define the responsibility, authority and interrelation of all personnel whose work affects quality products.
- Define how corrective actions are taken including: investigation, analysis of quality records, initiation of corrective actions, verification of corrective actions, and implementation of necessary procedural changes or training programs.
- Keep records of identified quality issues.
- Carry out quality verification activities by personnel not directly responsible for performing the work.
- PM Contract Review: Ensure contractual requirements, including change orders, are adequately defined, documented, and communicated; define a plan for ensuring schedule compliance; define how differences between customer and product requirements are resolved; keep records of these transactions.
- PM Design Control: Define how design plans are developed and updated, identify technical interfaces between groups, identify who is responsible for resolving ambiguous or conflicting design requirement, identify how design requirements are documented, identify the competent person(s) responsible for verifying the design.
- Document Control: Define procedures for conducting reviews and approving documents, including identification of responsible personnel.
- Establish process for conducting internal quality audits (see functional diagram).
- Define procedures for maintaining and updating the Quality Assurance System and process improvement.

Team Member Roles

To address these Quality System Requirements, Art Anderson Associates has established a “multiple level review” Quality Assurance (QA) procedure. This procedure employs five primary team member roles, described as follows:

QA Manager: Responsibilities: Ensure all documentation is maintained; manages timely execution of the QA process to keep project on time and on budget. Reports to the PM on any found issues and actions taken to correct. Qualifications: Must be experienced with Art Anderson Associates' and customer's project standards and practices, have technical proficiency in AutoCAD and other software utilized in the creation of the document, and must be knowledgeable and familiar with each project deliverable assigned to them for review. Will be well versed in ISO 9001 Model for Quality Assurance.

Technical Lead (Selected by the PM): Responsibilities: Ensure all QA documents are in the deliverable package. Develop the deliverable according to the technical requirements, ensuring it is accurate, clear,

meets all applicable regulatory requirements, company and client standards, is in compliance with the contract and the Technical Adequacy Checker has executed a complete review of all issues that may affect final design. Technical Lead shall sign the *Deliverable Quality Record*, signifying compliance and completion of the technical review and present deliverable to the PM for review. Qualifications: Should be an experienced engineer with verifiable experience in the appropriate discipline.

Standards Checker: Responsibilities: Make initial quality checks of each deliverable; ensure both format and technical content are displayed in accordance with contract standards and specifications, company standards and any other task or delivery requirements; utilize the appropriate *Acceptable Criteria Checklist(s)* to identify any defects to the deliverable, and be responsible for verification of all non-technical aspects of the product being checked. For technical documents, such as specifications or calculation sheets, verification shall address format, spelling, illustrations, security and safety. Standards Checker will sign the *Deliverable Quality Record* signifying compliance of non technical standards are completed. Qualifications: Must be experienced with Art Anderson Associates' and customer's project standards and practices, have technical proficiency in AutoCAD and other software utilized in the creation of the document, and must be knowledgeable and familiar with each project deliverable assigned to them for review.

Technical Adequacy Checker (Selected by the Tech Lead or PM): Responsibilities: Verify technical content of the deliverable is accurate, clear, and concise in accordance with all applicable regulatory, company, and client standards; check for contractual compliance, constructability, and any other issues that may affect final design; maintain all forms and *Acceptable Criteria Checklists* pertaining to their review, and return the deliverable to the Technical Lead. Qualifications: Must be an engineer with related experience in a specialized category (or categories).

PM (Selected by the VP): Responsibilities: Ensure all project deliverables undergo a QA review and meet the technical and contractual requirements, constructability, schedule timetable, tracking the deliverables and all other issues that may affect the final design including items listed on the *Action/Issues Spreadsheet*. The PM shall verify all checklists are properly filled out, all comments have been completed, all signatures have been filled out and quality requirements of the customer and company standards and requirements specified herein, are met. The PM is directly responsible to the VP of the Marine Division for ensuring all task requirements have been met satisfactorily, and the PM and VP (where appropriate) date and sign the *Deliverable Quality Record* sheet which signifies the deliverable is ready to be submitted to the client. The PM is then responsible for preparing the *Transmittal* for submittal to customer.

Qualifications: Shall be a licensed professional engineer with no less than 6 years experience and have broad experience in the management and administration of technical contracts. Also be familiar with the contractual application of customer systems, materials and standards, and quality assurance requirements of the government and regulatory bodies imposed on the development of engineering drawings and other technical documents.

Documentation

Art Anderson Associates has developed key forms used to document and track all products through our process. The PM(s) working closely with the QA Manager, will ensure each and every deliverable meets or exceeds all the QA requirements using the following set of forms. All QA records shall be maintained as project records found in the project task folders and made available to the Client upon request.

Acceptance Criteria Checklist(s): These checklists present separate criteria addressing various aspects of each deliverable type including technical and non-technical issues. Checklists can be used by the preparer (ensuring a quality product) as a guideline as the product is being developed. If incomplete items are found, there will be a comment and the person(s) responsible to correct the comment shall mark completed after the correction has been performed.

Final Acceptance Certification: This document is used for the final deliverable after it has met client approval, regulatory body approval (if required) and is ready for PE signing if contract requires such action. This document is included with the deliverable and can be found in the task project folder.

Deliverable Quality Record: This cover sheet shall be attached to all deliverables and travels internally with the product and provides for various review points by the Standards Checker, Technical Lead, PM, and VP. Addresses design specifics, formatting, effects on vessel craft and weight and moment, safety issues, installation and technical issues, illustrations, specifications or calculation sheets and security issues. This will be initialed by the VP and PM who will certify all task requirements have been met satisfactorily and it is ready to submit to client. The blank line above reviewer signatures is to be filled in for the appropriate submittal, i.e. Preliminary.

Transmittal: This document shall be filled out by the PM, or their designated representative, to address the client, submittal description and type of material being transmitted.

While all individuals in the design and production process are committed to quality work, formalizing the process with the documents above will ensure all quality criteria have been considered and comments from client or any other action items are not overlooked. All of these documents, as they are completed, will be kept by the QA Manager in a notebook or file system. At the end of each project, they will constitute a history of each deliverable's development.

QA Process Flow

Flow Details

- Document/Deliverable is completed and the QA process begins.
- As Directed by the PM:
 - Technical Lead assembles deliverable package with appropriate QA forms.
 - Technical Lead submits to the Standards Checker – Applicable checklists are reviewed and marked with comments as needed then initialed and dated.
 - Technical Lead then submits to the selected Technical Adequacy checker – Applicable checklists are reviewed and properly filled out per their review of the document(s), signed and dated. Returned to Tech Lead.
 - Technical Lead then submits to appropriate person for corrections and coordinates corrections or if no corrections are needed it is submitted to the PM.
- PM reviews document and if corrections are required it is returned to the Technical Lead for incorporation of corrections. If there are no corrections the PM signs and dates approving it is ready for submittal and the VP of Marine Engineering signs and dates. PM sends to client with transmittal sheet completed.
- If client returns the document with comments the PM will discuss the comments and the Technical Lead will conduct the actions to be taken to get comments incorporated and the QA process starts again as appropriate.

Diagram of QA Plan and Functional Relationships

The diagram below identifies the functional relationships in our QA System and QA Process flow:

