

CHAPTER 7
Quality Assurance (QA)

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CHAPTER 7 Quality Assurance (QA)

7.1 Introduction

7.1.1 Concept

Quality Assurance (QA) is fundamentally the prevention of the occurrence of defects and is an integral part of every maintenance process from start to completion.

7.1.2 Objectives

The objectives of QA within the NAMP are:

- a. Improve the safety of flight and ground operations.
- b. Improve the quality, uniformity, and reliability of aircraft and equipment.
- c. Improve the quality of maintenance materials, technical data, and processes.
- d. Improve the skills and consistency in performance of maintenance personnel.
- e. Eliminate unnecessary man-hours and material expenditures.

7.1.3 Responsibility

QA is the responsibility of every individual involved with naval aviation maintenance. Although the QA Officer (QAO) is responsible for managing the overall quality assurance effort within the maintenance department, each Division Officer, Division Chief, Work Center Supervisor, and technician is equally responsible for maintenance quality.

NOTE: The Fleet Readiness Center (FRC) D-level Quality Program (DLQP) is described in [paragraph 7.7](#).

7.1.4 Terms

The terms QA, inspection, auditing, and monitoring have distinct meanings as they apply to the NAMP:

a. QA is the planned and systematic pattern of actions taken to verify the item conforms to specifications and will perform satisfactorily.

b. Inspection is the physical examination and testing of aircraft, engines, equipment, components, parts, and materials to determine conformance to specifications.

(1) Final inspections are specific QA functions performed following the completion of a maintenance task when proper accomplishment of the task can be determined by visual inspection.

(2) In-process inspections are required during the performance of maintenance where satisfactory accomplishment of the task cannot be determined after the task has been completed. Requirements for an in-process inspection include, but are not limited to, witnessing application of torque, functional testing, adjusting, assembly, servicing, and installation. The notation "QA" appears on each Maintenance Requirement Card (MRC) containing an in-process QA task.

(3) Receipt or screening inspections apply to material, components, parts, equipment, logs, and records, Configuration Management Auto Log-sets (CM ALS), and documents. Receipt inspections are normally conducted to identify the material received, determine its condition and maintenance requirements, and verify the accuracy of accompanying records.

c. Auditing is the periodic or on-condition evaluation of compliance with specified policies and procedures. Examples of audits include QA program audits, Division Officer work center audits, and program manager assessments. Refer to [paragraph 10.7](#) for guidance on auditing.

d. Monitoring is the physical observance of a process to verify compliance with procedures, for example, a Quality Assurance Representative (QAR) watching an aircraft towing evolution or the Line Division Supervisor watching a fuel sample being taken to verify correct procedures are being adhered to and all safety precautions are being followed. Monitoring also includes routine collection and trending of performance data, for example, oil consumption and foreign object damage (FOD) trends. Active monitoring of ongoing maintenance by supervisors, managers, and QA personnel is one of the most important aspects of ensuring quality.

7.2 Quality Assurance Division Organization

At a minimum, one member will be assigned to QA Division to provide coverage for each of the billets specified in the applicable Quality Assurance Organizational Chart ([Figure 7-1 through Figure 7-4](#)). The Maintenance Officer (MO) will determine the number of additional Quality Assurance Representatives (QAR) assigned to the QA Division, and the number of Collateral Duty Quality Assurance Representatives (CDQAR) and Collateral Duty Inspectors (CDI) assigned to production work centers based on operational requirements, QA workload, and number of work shifts.

NOTES: 1. Operations Maintenance Division (OMD) and permanent or temporary detachments with four or less aircraft that organize QA per [Figure 7-3](#) must assign a QA Officer and a QA Supervisor. The QA Officer and QA Supervisor assignments will not be collateral duties assigned to other maintenance billets.

2. QA Supervisors may also be designated as QARs in their areas of technical expertise.

3. Helicopter Mine Countermeasures (HM) squadrons with separate Maintenance Departments for aircraft and Airborne Mine Countermeasures (AMCM) systems will operate a single QA Division under the cognizance of the Aircraft Maintenance Department. The Aircraft Maintenance Department QA Division will be equally responsible to both departments for the accomplishment of all QA functions.

7.3 Quality Assurance Personnel

Personnel assigned to QA duties are the direct representative of the Commanding Officer (CO) for ensuring the quality of aircraft, engines, components, and equipment, and must possess the highest standards of professional integrity. In addition to inspection duties, QARs, CDQARs, and CDIs serve as trainers and mentors in their areas of expertise.

7.3.1 Quality Assurance Representative (QAR)

QARs are permanently assigned to the Quality Assurance Division. QAR qualifications:

a. Paygrade E-6 or above.

b. (Navy) Fully qualified in the Qualified and Proficient Technician (QPT) syllabus in their technical field for the type/model/series (T/M/S) aircraft supported.

c. (Marines) Fully qualified in the Aviation Maintenance Training and Readiness Program (AMTRP) syllabus in their technical field for the T/M/S aircraft supported.

d. Complete the QAR training syllabus and personnel qualification standards (PQS) applicable to their billet assignment, and pass the written examination administered by QA.

NOTE: Completion of the Naval Aviation Logistics Command Management Information System (NALCOMIS) (Optimized) Organizational Level Maintenance Activity (OMA) Quality Assurance Administration course (Course C-555-0046) is recommended, but not required.

e. Skilled in researching, reading, and interpreting drawings, maintenance technical manuals, directives, and data.

f. Able to write with clarity and technical accuracy.

g. Conscientious and committed to quality in all aspects of naval aviation.

7.3.2 Collateral Duty Quality Assurance Representative (CDQAR)

CDQARs are assigned to production work centers when needed to supplement the QA Division's capacity to perform QAR-level inspections. CDQARs are responsible to the QA Officer when performing QA functions. CDQAR qualifications:

a. Paygrade E-5 or above.

b. Complete the same training and testing syllabus as QARs assigned to the commensurate QA Division rate or military occupational specialty (MOS) billet, with the exception of the NALCOMIS (Optimized) OMA Quality Assurance Administration course (Course C-555-0046).

NOTES: 1. CDQARs may be assigned only if the minimum QAR manning requirements (Figure 7-1 through Figure 7-4) for their rate or MOS billet have been met.

2. CDQARs may be temporarily assigned to the QA Division when there is a severe shortage of skill or to relieve QARs during short periods of absence, such as leave, temporarily assigned duty (TAD), or hospitalization.

3. Except where specifically stated in this instruction, CDQARs will not be assigned to perform non-inspection functions, such as QA audits, when a commensurate billet exists in the QA Division.

4. A CDQAR may perform initial qualification sign-offs and subsequent proficiency and practical examinations specified to be performed by a QAR, if they are fully qualified in the respective area.

7.3.3 Collateral Duty Inspector (CDI)

CDIs inspect all work and comply with the required QA inspections during all maintenance actions performed by their production work center. CDIs are responsible to the QA Officer when performing QA functions. CDI qualifications:

a. Paygrade E-4 or above.

b. Qualified in the NAMP programs and processes applicable to their work centers.

c. Complete the CDI training syllabus applicable to their assignment, and pass the written examination administered by QA.

7.3.4 Training

7.3.4.1 Type Wings and Marine Aircraft Wing (MAWs) must publish local command procedures (LCP) that include QAR, CDQAR, and CDI training syllabus or PQS, and a written test for each Navy Enlisted Classification (NEC) or MOS and work center assignment, for each T/M/S aircraft supported. I-level activities must establish a QAR, CDQAR, and CDI training syllabus or PQS, and written test requirements specific to the engines, components, and equipment they support. The training syllabus or PQS, and the test, must cover the QA requirements for test, inspection, and administrative processes specific to the QAR, CDQAR, or CDI assignment. Specific areas to be covered in the syllabus include:

- a. QPT or AMTRP requirements.
- b. Formal school requirements applicable to their QA billet.
- c. Testing and inspection procedures, for example; bore scoping, measuring FOD damage, measuring tolerances, corrosion focus area list (FAL) inspection techniques, conditional inspection requirements, in-process and final QA witnessed requirements for torque, functional testing, assembly, etc.
- d. Required reading, to include this chapter and all Naval Aviation Maintenance Program Standard Operating Procedures (NAMPSOPs) applicable to the QA billet.
- e. T/M/S Functional Check Flight (FCF) requirements, to include annotating the checklist and how to brief an FCF.
- f. QA sign-off and certification procedures.
- g. Data collection and monitoring procedures for areas applicable to the QA billet description.
- h. Auditing and monitoring techniques for the NAMP programs the billet is responsible for.
- i. Written test, with questions on Chapter 7, applicable NAMPSOPs, and other technical and administrative areas applicable to the billet.
- j. A practical examination to verify skill in the use of inspection equipment or other QA procedures.
- k. Topics for the oral interview by the QA Officer and QA Supervisor.

NOTE: In I-level activities with D-level artisans assigned for beyond capability of maintenance (BCM) interdiction, the QA Officer at the sending D-level activity and the QA Officer at the receiving I-level activity will collaborate on a joint LCP that specifies the training, tasks, special process certification procedures, and other requirements for D-level artisans to perform QA functions.

7.3.4.2 The QA Officer is responsible for ensuring QARs, CDQARs, and CDIs are trained and current in the QA processes related to their QA billet and work center assignment. If a QAR is assigned to perform inspections outside of their billet assignment, the QA Officer must verify they receive cross-training in any QA functions they perform that are not in their NEC or MOS area of expertise. If applicable, cross-training will include Center for Naval Aviation Technical Training Unit (CNATTU) training courses, on-job training (OJT), rotation of assignments, and task specific elements of the QAR training syllabus or PQS.

NOTES: 1. Cross-training is not permitted for QA functions related to egress systems or I-level Aviation Life Support Systems (ALSS) maintenance. Only qualified egress systems technicians and I-level ALSS technicians (graduates of approved Aircrew Survival Equipmentman (PR) School) are permitted to inspect the maintenance of personnel parachutes, drogue chutes (excluding drogue chutes in non-removable head boxes), seat survival kits, and inflatable survival equipment.

2. O-level activities having no or only one PR assigned must designate a cross-trained QAR or CDQAR to inspect work performed on ALSS equipment. Cross-trained QARs or CDQARs will use NAVAIR 13-1-6 series manuals for technical guidance.

3. QARs, CDQARs, and CDIs inspecting ALSS must be ordnance certified per OPNAVINST 8023.24 or MCO 8023.3.

7.3.5 Designation

7.3.5.1 QARs, CDQARs, and CDIs permanently attached or TAD to the activity must be designated by the activity's CO in writing via Quality Assurance Representative/Inspector Recommendation/Designation (OPNAV 4790/12) (Figure 7-5) or ASM equivalent. Requirements:

a. Meet the qualification requirements specified in paragraph 7.3.1, 7.3.2, or 7.3.3 for the applicable designation.

NOTE: COs may temporarily designate QARs, CDQARs and CDIs of lesser paygrade than specified, if deemed necessary due to manpower constraints. Under these circumstances, the most experienced personnel available will be assigned. The CO must inform their Type Wing or MAG by naval letter of each paygrade deviation. The letter must include the name, paygrade and designation (QAR, CDQAR or CDI) of each individual, the projected end date of the temporary assignment, and a detailed explanation for assigning someone of lesser paygrade, to include current and projected status of manning related to the billet.

b. Division Officers will review the qualifications of QAR, CDQAR, and CDI candidates and personally interview the candidate prior to endorsing the recommendation.

c. The QA Officer and QA Supervisor will verify the qualifications of QAR, CDQAR, and CDI candidates, and conduct an oral board per the Type Wing or MAW training syllabus, prior to endorsing the recommendation.

d. The MO must endorse the recommendation prior to forwarding to the CO for designation.

e. The QA Officer must prepare a billet description with specific QA functions and responsibilities for each QAR, CDQAR, and CDI.

7.3.5.2 QARs, CDQARs, and CDIs permanently attached or TAD to the activity must be designated by the activity's CO in writing via Quality Assurance Representative/Inspector Recommendation/Designation (OPNAV 4790/12). COs of activities that deploy detachments may authorize detachment officers in charge (OINC) to designate QA personnel, provided the deployment period is in excess of 90 days and all procedures and requirements for designating QA personnel are accomplished by the detachment.

7.3.5.3 The Weapons Officer must designate personnel TAD or permanently attached to the Weapons Department or Navy Munitions Command detachment. Weapons Department personnel assigned to an I-level activity work center must be designated by the I-level activity CO.

7.3.5.4 QARs, CDQARs, or CDIs that are TAD to another command operating or supporting the same T/M/S aircraft may be designated as a QAR, CDQAR, or CDI by the TAD unit CO without re-completing QAR, CDQAR, or CDI training. Prior to designation, the qualifications of the temporarily assigned QAR, CDQAR, or CDI candidate must be reviewed and the candidate must be interviewed and endorsed for designation by the TAD unit Work Center Supervisor, Division Officer, Quality Assurance Officer, and MO.

7.3.5.5 QAR, CDQAR, and CDI designation is suspended when personnel are TAD outside of the maintenance department. Designation may be reinstated on return to the maintenance department without recompleting training or testing, if all other qualifications are current, as deemed by the QAO.

7.3.5.6 Fleet Replacement Squadron (FRS) COs and Center for Naval Aviation Technical Training Unit (CNATTU) OINCs must co-sign a letter of agreement delineating each organization's responsibilities for Integrated or Consolidated Maintenance Training CDIs (if applicable). These CDIs will be designated by the FRS CO, and the "FOR" block on the OPNAV 4790/12 (Figure 7-5) will read: "Integrated/Consolidated Maintenance Training CDI for Work Center ____."

7.4 Quality Assurance Division Responsibilities

Quality Assurance Division must:

- a. Manage the programs prescribed in [paragraph 7.6](#).
- b. Perform mandatory QA inspections as specified in maintenance technical manuals, technical directives (TD), and other directives.

NOTE: I-level activities with D-level artisans performing BCM interdiction must ensure D-level mandatory verification requirements are performed only by D-level QA Specialists. The I-level activity will publish a LCP per [Appendix D](#) to specify inspection procedures for BCMI, to include whether a D-level artisan or I-level QA inspector performs the final ready for issue (RFI) certification.

- c. Monitor inspections and tests of aircraft, engines, components, and equipment to verify correct procedures are being followed.
- d. Annually, at a minimum, monitor CDIs to verify their compliance with CDI procedures.
- e. Manage the Central Technical Publications Library (CTPL) per [paragraph 10.8](#), and control classified technical publications for the department.
- f. Analyze quality related data and take action to improve the quality of maintenance; for example, providing training on troubleshooting and repair procedures for components with recurring Action Taken Code "A" Malfunction Code "799" (No Defect) or When Discovered Code "Y" (Found defective upon receipt). Quality data will be tracked in spreadsheets or graphs. At a minimum, QA will track:
 - (1) Action Taken & Malfunction Code A-799: NO REPAIR REQUIRED - NO DEFECT. Track by part number (P/N), serial number (S/N), bureau number (BUNO) or equipment removed from, removing work center, and technician.
 - (2) (I-Level Activities) When Discovered Code "Y" (Found defective upon receipt or withdrawal from Supply). Track by P/N, S/N, and repairing work center and technician.
 - (3) (Aircraft Reporting Custodians) FOD Rate. Track reportable FODs per flight hour.
 - (4) (Aircraft Reporting Custodians) Ground and In-Flight Aborts. Track by cause and BUNO.
 - (5) (Aircraft Reporting Custodians) When Discovered Code "A" (Before Flight - Abort - Aircrew). Track by discrepancy and BUNO.
 - (6) (Aircraft Reporting Custodians) When Discovered Code C (In-Flight - Abort). Track by discrepancy and BUNO.

g. (I-Level Activities) Investigate the cause of parts, components, and assemblies inducted with a When Discovered Code “Y” (Found defective upon receipt). The investigation will be documented on the Y-Code Process Form (Figure 7-6). Completed forms will be kept for one year. QA will maintain an electronic or hardcopy log of Y-Code reports with the following information: report number by calendar year and sequential S/N (2016-001 followed by 2016-002, etc.), date initiated, QAR assigned, work center, P/N, and S/N.

NOTE: If a D-level artisan participated in the repair of the discrepant equipment, the artisan will assist with the investigation.

h. (Aircraft Reporting Custodians) For each BUNO assigned, maintain a history file with BUNO-specific information not documented in NALCOMIS. At a minimum, the file will contain:

- (1) Oil Analysis results.
- (2) T/M/S specific out of limits conditions (oil consumption, vibrations, over temperature).
- (3) Completed FCF Checklists.
- (4) Completed Material Condition Inspection (MCI) Checklists.

i. Brief FCF pilots and aircrew on the purpose and objectives of the FCF. After completion of the FCF, QA will debrief check pilots, aircrew, Maintenance Control, and work center representatives to determine compliance with the FCF objectives and review discrepancies found during the FCF.

NOTE: Completed FCF Checklists will be retained in the aircraft’s history file for a minimum of 6 months, or one phase cycle, whichever is greater.

j. Maintain a list of personnel assigned as QAR, CDQAR, and CDI. If using NALCOMIS OOMA, review user LOGIN IDs against Special Maintenance Qualifications (SMQ) and verify only qualified personnel have QAR or CDI SMQs. If using NALCOMIS IMA, the NALCOMIS Personnel Management Subsystem performs this function.

7.5 QA Inspection and Certification

7.5.1 Inspection Requirements

7.5.1.1 Only designated QA personnel (QARs, CDQARs, and CDIs) are authorized to perform specified QA inspections. When QARs, CDQARs, or CDIs sign an inspection report, they are certifying:

- a. They personally inspected the work.
- b. The work was completed in accordance with current instructions and directives.
- c. The work is satisfactory in all respects.
- d. Any parts or components removed were properly replaced and secured.
- e. The item is Safe for Flight or use.

7.5.1.2 In-process and final inspections may be conducted by CDIs; however, a QAR or CDQAR must perform the in-process and final inspections of any task, which requires the aircraft to have an FCF per Chapter 5, regardless of whether or not an FCF is flown. For example, if a procedure requiring an FCF that has steps A through C, and step B drives the requirement for the FCF, a CDI may only witness steps A and

C; a QAR or CDQAR must witness and make an in-process entry for step B and must sign the final inspection.

NOTES: 1. A QAR or CDQAR must conduct in-process and final inspections of maintenance performed on egress systems, personnel parachutes, and flotation devices when the affected mechanism or function of the equipment is not re-inspected or functionally tested before flight.

2. QARs, CDQARs, and CDIs will not perform QA inspections and certifications on their own work.

7.5.1.3 QA MRCs are provided for certain maintenance tasks that, if improperly performed, could cause equipment failure or jeopardize the safety of personnel. The QA appearing on MRCs signifies a QA function is required. Commands will use the criteria of this chapter to determine whether a QAR or CDI will perform the QA functions listed on the MRC, and will annotate the affected cards in the master and work center MRC decks. A list of cards with QAR or CDI inspection requirements must be signed by the MO and maintained with the applicable MRC deck or listed in the MMP.

a. For paper MRCs: Maintained with the MRC deck behind the title card and immediately after any IRACs.

b. For electronic MRCs, to include those residing within an IETM, an electronic copy of the inspector level listing shall be on each PEMA in a folder on the PEMA desktop.

NOTE: Fleet Squadrons that are unable to comply with electronic MRCs shall use the required procedures in the T/M/S IETMS. These procedures shall be signed by the MO and listed in the MMP.

7.5.2 Inspection Certification

7.5.2.1 General certification requirements:

a. Completion of a QA inspection must be certified by signature, stamp, or lead crimp.

b. The Inspected By block on work orders (WO) and maintenance action forms (MAF) will only be signed or stamped by the QAR, CDQAR, or CDI that actually inspected the work.

NOTES: 1. An individual with WO or MAF administrative certification authority may sign the QA block on documents that do not involve an actual inspection; for example, a control document for a phase inspection and special inspection. A control document is an administrative certification that all QA functions associated with the inspection were performed by designated QA inspectors and all necessary documentation was completed, for example, look and fix phase documents, were reviewed and accepted.

2. CDIs will verify correct Work Unit Code, Malfunction Description Code, Action Taken Code, Transaction Code, Type Maintenance code, Installed/New Item data, and an accurate and complete Corrective Action statement prior to signing the WO or MAF.

c. NALCOMIS activities must assign personal SMQ passwords to each individual designated as a QAR, CDQAR, or CDI.

d. QA stamps may be used on hardcopy documents in place of signatures and initials, where use of initials are specifically authorized. QA stamps must be closely controlled and securely stored by QA Division. QA Inspectors will be issued a stamp with a unique identifying number. QARs, CDQARs, or CDIs temporarily assigned to another unit will only use QA stamps issued by the TAD unit, if designated per [paragraph 7.3.5.4](#).

NOTES: 1. A stamp may not be reassigned to another inspector within a period of 3 months.

2. Lead crimps used by inspectors to seal or secure inspected items must be issued and controlled in the same manner as QA stamps.

7.5.2.2 Organizational Level (O-Level) inspection certification procedures:

a. On receipt of a maintenance task that requires an in-process inspection, the inspecting QAR or CDI is responsible for building the QA tasks into Naval Tactical Command Support System (NTCSS) Optimized OMA NALCOMIS WOs.

b. If all in-process inspections of a maintenance action are performed by a single QA inspector, the individual in-process inspections are not required to be documented on the WO. The Inspected By block on the WO indicates the inspector completed all required in-process inspections and the final inspection for the entire maintenance action.

c. When multiple in-process inspections are performed by a single QA inspector, these may be documented on the WO by a single in-process annotation as opposed to listing each in-process individually, for example, "Inspected in-process steps A-J".

d. If an O-level activity elects to use QA stamps on hardcopy WO or MAF or other QA document, the stamps must be issued only to QARs and CDQARs.

7.5.2.3 Intermediate Level (I-Level) inspection certification procedures:

a. I-level activities using NALCOMIS OIMA must assign individual SMQ passwords to each designated QAR, CDQAR, and CDI.

NOTE: In NALCOMIS OIMA, the MAF Inspected By field is completed using the Maintenance Activity Subsystem MAF clearing functions. These functions permit individuals with appropriate SMQs to document their inspection and approval of the repair action or, if necessary, reject the repair action.

b. QA stamps are required for I-level ALSS inspection records, calibration Metrology Equipment Recall (METER) cards, and all non-NALCOMIS maintenance documents; for example, hardcopy Visual Information Display System/Maintenance Action Forms (VIDS/MAF).

7.5.2.4 Inspection certification for work by D-level artisans assigned to an I-level activity.

a. Depot artisans are authorized to self-certify their own work to the extent certified to do so by their parent D-level FRC. Certification standards and procedures must be formally agreed on, in writing, by the CO of the D-level activity and the CO of the supported I-level activity.

NOTE: Only a D-level QA Specialist will accomplish Type I depot QA verifications.

b. Artisans assigned to I-level activities will receive NALCOMIS training from the activity's NALCOMIS Data Base Administrator (DBA), and must use NALCOMIS Optimized to document and certify work accomplished at the I-level activity. Procedures:

(1) The DBA will initiate a generic D-level artisan logon for each artisan to populate the MAF Corrected By field.

(2) The I-level activity's QA Officer must review the artisan's D-level task certifications, and will authorize the DBA to grant the artisan the commensurate CDI and supervisor SMQ access.

NOTE: The artisan's D-Level supervisor must provide the I-level activity QA Officer with the artisan's task certification records.

(3) MAFs with D-level QA verification requirements will be checked "QA REQUIRED".

(4) Artisans will complete the Inspected By and Supervisor fields with their personal logon.

NOTES: 1. Signing the Inspected By field on the MAF signifies certification. Signing the Supervisor field indicates the MAF has been screened for accuracy and completeness and that QA and tool control requirements have been met.

2. In-process inspections that have multiple mandatory verification steps must be individually documented using the in-process inspection function of NALCOMIS. The last verification step is certified complete when the Inspected By field is signed off.

c. If a D-level artisan is required to certify documents with a stamp imprint, the I-level activity will issue the stamp. Artisans temporarily assigned to an I-level activity will use the certification stamp issued by their D-level activity. Artisan stamps will be inventoried and accounted for in the same manner as I-level activity stamps.

7.5.2.5 QA requirements for transient or in-flight maintenance.

a. During transient or in-flight maintenance, the pilot in command or the senior aircrew maintenance person will inspect the work performed from a technical standpoint and sign for QA. The inspector will verify:

(1) Adequate maintenance was performed to correct the discrepancy.

(2) Maintenance areas are free of foreign objects.

(3) Opened panels or doors are correctly closed.

b. If transient or in-flight maintenance involves flight safety, a QAR must re-inspect the repairs on return to home base.

7.6 Quality Assurance (QA) Division Program Management (O-level and I-level).

The QA Division is responsible for managing the following processes:

a. NAMP Compliance Auditing per [paragraph 10.7](#).

b. Naval Aviation Maintenance Discrepancy Reporting Program (NAMDRP) per [paragraph 10.9](#).

c. Technical Data Management per [paragraph 10.8](#).

d. Maintenance Department Safety per [paragraph 7.6.1](#).

e. SE Misuse/Abuse Reporting per [paragraph 7.6.2](#).

f. Aircraft Confined Space Program per [paragraph 7.6.3](#).

g. (O-level) Vibration Analysis per [paragraph 7.6.4](#)

7.6.1 Maintenance Department Safety

7.6.1.1 The QA Supervisor is the Maintenance Department Safety Manager. Responsibilities are addressed in OPNAVINST 5100.23 for ashore activities and OPNAVINST 5100.19 for afloat activities.

NOTES: 1. In activities without a QA Supervisor billet, the MO will designate a QAR or CDQAR as the Maintenance Department Safety Manager, in writing, via the MMP.

2. O-level and I-level activities are required to coordinate Occupational Safety and Health (OSH) compliance with the local region Commander, Naval Installations Command per OPNAVINST 5100.23.

7.6.1.2 OPNAVINST 5100.19 and OPNAVINST 5100.23 contain safety policy for ashore and afloat activities and cover topics, such as hearing conservation, respiratory protection, Hazardous Material Information Resource System (HMIRS), and other safety requirements. Fall Protection is a critical safety requirement for ashore activities and is specified in OPNAVINST 5100.23.

7.6.1.3 QA will perform inspections of maintenance equipment and facilities to verify compliance with fire and safety regulations, to include verifying that workspace environmental conditions are satisfactory, work center equipment is maintained in a safe operating condition, and equipment operator qualifications and licensing are being followed.

7.6.1.4 OPNAVINST 3750.6 contains policy for Maintenance Department participation in aviation safety, including investigation and reporting of aviation hazards that are not reportable under the NAMP.

7.6.1.5 When a report is required by OPNAVINST 3750.6, QA will collect and provide maintenance and material data necessary for the preparation of reports. OPNAVINST 3750.6 contains detailed report preparation procedures. Submission of reports required by OPNAVINST 3750.6 does not negate the requirement for submission of reports required by the NAMP.

7.6.2 O-level and I-level Support Equipment (SE) Misuse/Abuse Reporting

7.6.2.1 Misuse/abuse of SE can cause injury, ground mishaps, excessive repair and replacement costs, and reduced operational readiness.

7.6.2.2 Reporting SE misuse/abuse is an all hands responsibility. Anyone witnessing SE misuse/abuse will prepare and forward an SE Misuse/Abuse Form (OPNAV 4790/108) (Figure 7-7) to the activity having reporting custody for the SE. Handwritten forms are acceptable.

7.6.2.3 QA of the activity initiating the report will:

a. Assign a control number consisting of the calendar year and a sequential number (2015-01, followed by 2015-02, etc.).

b. Conduct an investigation and complete the front page of the OPNAV 4790/108. The investigation must include an analysis of licensing, training, certification, maintenance procedures, safety precautions, and related trends as potential root causes. The Narrative Description section will contain a detailed report of the misuse/abuse that occurred, and the results of the investigation. If the misuse/abuse resulted in damage, the report will include an estimate of the repair or replacement cost from the designated repair activity for each item damaged. The QA investigation and the report will be completed within 2 working days after occurrence of the misuse/abuse.

c. When the investigation is complete, the QA Officer will sign as the Reporting Official on the front of the OPNAV 4790/108 and forward the report to the MO for review. If the offender is assigned to the

command, the MO will direct whatever personnel action is deemed necessary, fill out the “Action Taken/Recommended” block on the back of the OPNAV 4790/108, and sign it. If the individual accused of misuse/abuse is assigned to another command, the MO will leave the back of the report blank and forward the report to the offender’s command. If the SE or other items were damaged, a copy of the report must also be forwarded to the command with reporting custody of the damaged equipment.

- d. Completed forms must be retained in electronic or hardcopy format for 2 years.

NOTES: 1. If the misuse/abuse resulted in a mishap, QA must coordinate with the Industrial OSH Department. QA will forward the SE Misuse/Abuse Report to the Manager or Subcustodian (Project Lead) of the equipment and to the Review Board (if established) of the command where the misuse/abuse occurred.

2. If the offender belongs to another command, QA must forward a copy of the completed report to the parent command.

7.6.3 Aircraft Confined Space Program (ACSP)

7.6.3.1 The objective of the ACSP is to verify a safe working environment when working on aircraft and aeronautical equipment fuel cells and tanks.

7.6.3.2 The QA Officer will designate a QAR as the ACSP Program Manager responsible for maintaining compliance with NAVAIR 01-1A-35, which prescribes ACSP requirements ashore and afloat.

NOTE: O-level activities with three or less aircraft confined space requirements in a 6-month period may use the Entry Authority (EA) of the supporting I-level activity.

7.6.3.3 D-level FRC activities will task the OSH office with ASCP program management responsibilities and may leverage resources towards better suited program managers per paragraph 7.7.1(a).

7.6.4 Vibration Analysis Program

a. Vibration analysis detects faults and degradation in aircraft, dynamic components, and engines by the analysis of trends in vibration characteristics. The objectives are to reduce vibration related material failures, reduce crew fatigue, and improve safety, reliability, and readiness.

b. Vibration analysis is required for all aircraft with technical manual requirements and procedures for troubleshooting vibration, performing vibration analysis.

c. Personnel performing vibration analysis must be trained in vibration testing procedures and limitations specified in applicable T/M/S aircraft, engine and dynamic component technical manuals.

d. Vibration analysis results will be recorded and trended for each applicable aircraft, engine and dynamic component.

7.7 FRC D-level Quality Programs (DLQP)

7.7.1 Program Responsibilities

a. FRC D-level activities are typically manned by government civilian or contractor personnel. Personnel assigned QA duties are QA Specialists or Artisan Inspectors (AI). [Figure 7-4](#) shows a typical FRC D-level QA structure. Structures may vary due to the organization size, product lines, and resources. FRC D-level activities have resources, such as Training Management Offices, In-Service Support Centers (ISSC), material laboratories, engineering and logistics capabilities, and subject matter experts (SME) better suited to perform testing, training, qualifications, and publication management. To leverage these

resources, FRC D-level COs must assign NAMPSOP and non-NAMPSOP program management functions (as appropriate). The assignment of program responsibilities must be documented in the SME listing.

b. The Director of Quality oversees and coordinates the efforts of the Quality Department. The Quality Department:

(1) Directs and coordinates a life cycle quality program for assigned weapon systems and components.

(2) Advises the CO on all matters pertaining to quality.

(3) Participates in the formulation of command policy as a member of the Command Executive Policy Board and provides input to Commander, Fleet Readiness Center (COMFRC) regarding policy decisions affecting quality at all FRCs.

(4) Investigates and reports resolution of quality problems originating from Fleet activities.

(5) Is the focal point for technological advances and continual improvement in quality.

(6) Appraises and evaluates the effectiveness of quality efforts in the FRC D-level activities, vendors, or suppliers of materials and services.

(7) Provides technical guidance and services regarding quality matters to other departments within the command and to COMNAVAIRFOR Fleet activities through a formalized, on-site visitation program, and field team membership.

(8) Evaluates and determines the capability of systems and processes to consistently produce quality products and services by applying statistical process control techniques to monitor processing and assembly procedures of aircraft, engines, and components.

(9) Manage a comprehensive audit program that encompasses all programs and processes across the FRC D-level activities, per this instruction.

(10) Provide oversight of programs for NAMPSOP compliance.

c. FRC D-Level QA Specialists perform, administer, monitor, and review processes and practices to verify the quality of maintenance performed for the Department of Defense (DOD). This includes:

(1) Development of plans and processes for achieving and maintaining product quality throughout the item's life cycle.

(2) Monitoring of operations to prevent the occurrence of defects and to verify adherence to quality plans and requirements.

(3) Analysis and investigation of adverse quality trends or conditions and initiation of corrective action.

(4) Knowledge and application of QA principals and techniques, pertinent product characteristics, and associated manufacturing processes and techniques.

Note: QA Specialists are hired into position and do not require nomination.

d. FRC D-level AIs.

(1) AIs are personnel designated by the D-level FRC CO, using the Artisan Inspector Designation (OPNAV 4790/193) (Figure 7-8) to perform verification duties. The D-level FRC CO must verify all personnel performing QA functions have sufficient training and expertise, well-defined responsibilities, authority, and latitude to identify and evaluate quality defects, and initiate, recommend, or provide solutions.

(2) Although AIs are assigned to production work centers, they function in the same capacity as QA specialists and must meet the activity's local qualification requirements. AIs must be responsible to the QA Officer when performing QA functions and may be assigned on a temporary or permanent basis.

NOTES: 1. The designation and use of AIs is optional and applies to D-level FRC activities only. D-level FRC activities choosing to employ personnel in this capacity must comply with requirements in this chapter.

2. Artisans must only be designated as AIs when the FRC D-level QA Department is fully staffed to perform the functions specified in this chapter.

3. AIs must not inspect their own work or sign as Inspector.

4. Flight Line Verification requirements must only be accomplished by a QA Specialist.

(3) Prior to implementation of the AI process in a production work center, the Director of Quality must verify an assessment of the product line or work posture, quality audit results, and certification is accomplished.

(4) The Director of Quality must verify the activity's Engineering Department/ISSC reviews applicable technical manuals and work documents to determine the AIs mandatory requirements. Areas identified as requiring QA Specialist verification, due to criticality, risk, or other factors, must be clearly designated on the work documents per paragraph 7.7.6.

(5) The Director of Quality must verify personnel considered for AI designation have the required level of experience and are qualified on the product, process, system, and areas they are verifying.

NOTE: AI authority must not be granted to supervisors or individuals responsible for managing the production effort.

(6) Artisans selected as AIs must be nominated by the Production Work Center Supervisor and complete a specific, locally prepared, and documented QA function-training program. Artisans must be interviewed by the D-level FRC CO and Director of Quality.

(7) The Director of Quality must review the AIs qualification and training program results and provide appropriate recommendations to the D-level FRC CO prior to the AIs designation.

(8) The D-level FRC CO must designate AIs using the Artisan Inspector Designation (OPNAV 4790/193) Figure 7-8.

(9) AI qualifications, training, and designation letter must be documented on the Individual Qualification Record (IQR), Electronic Individual Qualification Record (EIQR), or Advanced Skills Management (ASM), and updated (as required) per the Certification Program paragraph 7.7.6, and local instructions.

(10) A unique stamp must be issued to AIs per Certification Program requirements per paragraph 7.7.6. and local instructions.

(11) The D-level FRC QA Department must continually monitor AI performance to include auditing and periodic verification by a QA Specialist. On a monthly basis, a working-level forum must be held by the area QA Specialist with the AIs to evaluate program performance, monitoring results, and improvement opportunities. On a monthly basis, an executive-level forum must be held by the Director of Quality with the D-level FRC CO to review program performance and process monitoring results of all areas.

(12) The Director of Quality must suspend individual AI certification authority when the integrity of the Certification Program is compromised, certification history proves a detrimental trend to quality of the products produced or other causal factors dictate per Certification Program ([paragraph 7.7.6](#)) and local instructions. The D-level FRC CO must formally revoke individual AI designation when causal factors dictate or on recommendations of the D-level FRC QA Department.

7.7.2 FRC DLQP Guidelines and Operational Procedures

a. The term DLQP identifies the collective requirements of this instruction. It does not mean that fulfillment of the requirements is the responsibility of any single organization, function, or person. The CO must delineate specific organizational responsibilities for accomplishment of these requirements.

b. COMNAVAIRSYSCOM and COMFRC embrace the intent and spirit of AIRSpeed and command-wide responsibility for product quality and reliability.

c. COMFRC holds the FRC D-level CO ultimately responsible for the quality of products produced and services provided under their command. The D-level FRC Director of Quality and QA Officer must coordinate the DLQP and advise the FRC D-level CO on all related matters. The FRC D-level Quality Department will verify all personnel performing QA functions have sufficient training and expertise, well-defined responsibility, authority, and organizational freedom to identify and evaluate quality problems and to initiate, recommend, or provide solutions.

d. The DLQP must incorporate the functional requirements of this section. Organizational responsibilities, derived from functional requirements, must be designated by local instructions.

7.7.3 Reliability Goals

a. Reliability is the probability that an item will successfully perform its designated function for a definite period under specified operational conditions. Naval aviation is dedicated to the application of the Reliability Centered Maintenance (RCM) concept to in-service and future naval aircraft, engines, aircrew systems, weapon systems, aircraft launch and recovery equipment, and SE. The ultimate goal is to maintain maximum weapon system availability at minimum cost. To achieve this goal, the following objectives have been established to provide:

(1) A disciplined process, which verifies that only technically justified PM tasks are performed by the appropriate maintenance level.

(2) A clearly documented data analysis package, with the technical justification for all maintenance requirements that will be used as the baseline from which adjustments to the maintenance program can be made for all maintenance levels.

(3) A service feedback and data collection capability that monitors the effectiveness of the maintenance program.

(4) An analysis capability to investigate and correct maintenance related problems, to identify hardware design deficiencies, and document specific resource savings.

(5) A technical audit trail as budgetary reinforcement for a more credible and justifiable maintenance program.

b. The most common form of deteriorated reliability is a change to the maintenance plan over and above that which is technically justified. These changes can start with the original task analysis and progress geometrically through well-meaning efforts to do more by both artisan and support functions. The ultimate result is reduced reliability caused by escalated maintenance induced failure and accelerated wear out.

7.7.4 Reliability Requirements

a. Maintenance of inherent reliability is accomplished through a D-level closed-loop systems approach. The DLQP provides monitoring, analysis, and specialized knowledge to initiate preventive actions that are effected by engineering, production, and other departments. The following must be achieved:

(1) Adequacy of the overall applied maintenance plan, not just the acceptability of individual items, must be judged through the use of Statistical Process Control, statistical analysis, and cost analysis.

(2) Identification of failure modes for elimination during the design process or averting their occurrence in in-service hardware through Periodic Maintenance.

(3) Evaluation of the process and procedural controls, which caused or permitted the failure.

(4) Detection of failure trends and the identification and measurement of problem areas.

(5) Adequacy of controls for material and component usage in the production process.

(6) Adequacy of problem solutions and responsibility assignments for preventive actions.

(7) Follow-up to evaluate the effectiveness of Periodic Maintenance actions.

b. FRC D-levels must maintain a program or programs that constantly check the application of maintenance plans and identify and prevent the introduction of unjustified D-level Periodic Maintenance tasks. The program(s) must be consistent with the RCM philosophy. All departments must verify that product reliability is checked through proper application and administration of this instruction. The program must include all management and technical actions necessary to determine that items conform to established reliability requirements.

7.7.5 Control of Incoming Material

a. Activities are responsible for maintaining control of all incoming aeronautical and aeronautical related requisitioned and contracted material.

b. The contractor or supplier is responsible for ensuring material conforms to contractual requirements. However, all departments have the inherent responsibility for ensuring only those materials conforming to contractual requirements are introduced into FRC D-level products and processes.

c. Source inspected aeronautical material will be inspected to the extent necessary to prevent use of nonconforming material into reworked equipment, parts, or components.

d. Aeronautical material identified as not source inspected will be inspected on receipt unless the purchase contract specifies that a contractor's Certificate of Conformance is acceptable.

e. Source inspected material received without a Certificate of Conformance or endorsed Material Inspection and Receiving Report (DD 250) will be inspected upon receipt. Material ordered through the Supply System will normally be received with a DOD Single Line Item Release/Receipt Document (DD1348-1). This will be considered evidence that the material has been inspected and accepted.

f. Source inspected material will be re-inspected, whenever quality data indicates unacceptable quality trends with vendor.

g. Procedures must be established to:

(1) Receive, inspect as necessary, and route incoming material.

(2) Verify payment for destination inspection of required material is not provided until the quality representative signs the Material Inspection and Receiving Report (DD 250), Order for Supplies or Services Request (DD 1155), or Certificate of Conformance.

(3) Maintain identification of material until used.

(4) Manage the Product Quality Deficiency Report (PQDR) Program.

(5) Monitor and track warranty and first article exhibits.

7.7.6 Certification Program

a. Certification is documented affirmation that all product characteristics affecting quality conform to applicable specifications and requirements.

b. Items produced by FRC D-level activities must be certified, indicating conformance to applicable specifications. Certification authorization must include, but not be restricted to, personnel performing the following functions:

(1) Product Certification.

(2) Examination and Evaluation Certification.

(3) Special Process Operator Certification.

(4) Production Control Certification.

(5) Planner and Estimator (P&E) Certification.

c. Personnel are only authorized to certify products, processes, systems, and areas they are specifically trained and qualified on. Supervisors are held accountable for training and qualifying personnel authorized to accomplish certification. The DLQP must verify the task or skill based qualification criteria process is adequate. The artisan qualification process must be administered as follows:

(1) Maintenance of aeronautical equipment must be performed per technical manuals, engineering directives, and other COMNAVAIRSYSCOM approved technical references.

(2) Maintenance may be assigned on a variety of aeronautical equipment within the artisan's trade specialty, based on their skill set developed from documented technical training, education, and experience. Technical skills have many general repair applications and can be competently exercised on multiple types of aeronautical equipment.

(3) Supervisors must use ORM principles to establish artisan training requirements for specific aeronautical equipment and maintenance processes that are determined to be highly complex, infrequently practiced, no functional test, single point failure, or required by higher authority or local policy.

(4) Supervisors must develop training requirements to include consideration of specific qualification standards, when deemed necessary, with appropriate engineering, quality, and training resources.

(5) Supervisors must assess and continually monitor each artisan's ability and maintenance performance to exercise discretion in prescribing and documenting training in advance of low risk and common maintenance.

d. Supervisors depend on subordinates to build quality into the products. It is not necessary for supervisors to be qualified in every aspect of work operations performed within their area of responsibility. Technical trade skill knowledge is not required of supervisors. Certification authority must not be granted to supervisors.

e. Personnel granted certification authority must certify their work and the work accomplished by others. Certification by an artisan is that individual's personal guarantee that all work has been accomplished per specifications. Personnel accepting responsibility for certifying their work and the work accomplished by others must be:

(1) Qualified in the same type of work operations as those they are certifying and for which they are accepting responsibility, for example, an electrician will certify only electrical work accomplished and must be qualified in the specific product, process, system, or area to be certified.

(2) Certifying the same type of work operation for another individual who is actually assisting the certifier in the work operation, for example, if it takes two electricians to perform a work operation, then the one who certifies the work document is accepting responsibility for the work accomplished by the electrician who assisted. If a work operation requires multiple trade skills, the work operation will be segregated to allow an electrician to certify for electrical and a hydraulic mechanic to certify for hydraulics.

f. Reassigned personnel require an authorization for extension of certification authority. When a certifier is transferred, extension of certification authority must be approved or disapproved per the DQLP after it has been absolutely determined that the certifier is thoroughly trained and qualified for the products, processes, systems, or areas he or she will be certifying. When reassigned after being loaned or detailed outside of their designated trade skill for longer than 1 year, employees must also be reevaluated for extension of certification authority.

g. Supervisors use specific qualification standards to verify technical training is provided for the specific products, processes, systems, and areas the certifier is responsible.

(1) Training may be informal, critical task, or formal classroom and must include the actual use of work documents and technical specifications. Sanctioned training by instruction or electronic media is acceptable.

(2) Once established qualification standards have been met, the supervisor will request the appropriate certification stamp or SMQ authorization from QA.

(3) QA must issue the appropriate stamp or SMQ authorization and record added skills or tasks in the artisan's record in the D-level FRC Training Management System, when required. When specific OJT is required by the Technical Authority (COMNAVAIRSYSCOM or NAVAIRWARCENACDIV) or the workload review process, it must be recorded as critical task training.

NOTE: QA must record skill or tasks only after evaluating the individual's competency in the work operation as it pertains to the product, process, system, or area.

(4) QA must maintain an individual qualification record reflecting the training and qualifications of assigned individuals. Individual qualification records provide a standard means of identifying an artisan's qualifications and training. All artisans involved in the certification program must have a qualification record to document their certification authority and training.

h. Individual indoctrination and ongoing training on the certification program must be provided to all personnel granted certification authority. Refresher training will be provided to certified individuals every 4 years and whenever the review of quality data reveals adverse trends.

i. Personnel granted certification authority must certify that each product and quality characteristic identified on work documents has been satisfactorily completed and conforms to prescribed requirements by affixing an appropriate stamp imprint and date or electronic password or signature verification used in NALCOMIS (initials or signatures are not acceptable) adjacent to each task or characteristic prior to verification. D-level FRC Certification during BCM interdiction by an artisan at I-level activities must be accomplished per [paragraph 7.7.7](#).

j. Movement of an item from one stage of maintenance to the next is authorized, if the appropriate characteristic has been certified on the work document. This authority is not extended for verification requirements.

k. In all cases where a product, process, system, or area is altered, entered, or disturbed after original certification, the actions must be adequately documented. Following completion of the work, it must be recertified and submitted for re-verification, if previously verified.

l. Each of the following is considered to be adequate cause for revocation of certification authority:

(1) Certification of nonconforming products, processes, systems, or areas when such actions are the result of negligence or serious incompetence.

(2) Failure to protect the stamp from use by other than the individual to whom assigned. Unauthorized use may be cause for disciplinary action.

(3) Certification of products, processes, systems, or areas not within the qualifications of the certified person's current assignment.

(4) Failure to comply with directives or instructions governing certification actions.

m. Procedures must be established to:

(1) Verify command-wide indoctrination and understanding of the Certification Program.

(2) Maintain unissued certification stamps in locked storage.

(3) Provide positive control of stamps, including issue and return of stamps due to artisan promotion, resignation, or retirement.

(4) Certify documents of those items or operations considered acceptable for continued service without rework or processing.

(5) Verify documentation matches items processed and reflects all work completed prior to moving to the next phase of production.

- (6) Document and monitor qualification training accomplished and currency requirements.

7.7.7 Quality Verification

a. Verification is a method of objective evaluation employed by trained and qualified QA personnel to measure the effectiveness of the Certification Program. Actual examination, measurement, witnessing of tests, or redundant, or concurrent certification, review of documented objective evidence describing product, or quality characteristics and comparisons are used to determine conformance to prescribed quality requirements.

b. All items produced by FRC D-levels may be subjected to quality verification. Verification may be applied to the completion, inspection, and certification of an artisan's assigned task. A thorough review of processing work documentation is conducted to verify compliance with all specifications and to control the process. The verification method employed will depend on the point reached in the processing cycle, type of product(s), criticality of the characteristic(s) or product being verified, quality history, and quality control techniques in use, such as SPC, redundant or concurrent certification, non-destructive inspection (NDI), automatic test equipment (ATE), and special process certification.

c. The verification method(s) used by personnel trained to perform the QA function must consist of one or more of the following categories:

- (1) Actual verification (measurement or witnessing of tests) of the product and associated certified work documents. This method is mandatory for all safety of flight, flight critical, critical safety item characteristics and all tasks, which require the aircraft to have an FCF per [Chapter 5](#), regardless of whether or not an FCF is flown per type specific NATOPS manuals.

- (2) Witness redundant or concurrent certification by a second qualified certifier.

- (3) Verify certified work documents attesting to quality conformance and accepting certification that the characteristic(s) or product conforms to quality requirements.

- (4) Use product or process surveillance based on an effective audit program and an objective statistical history.

d. Products produced and processes used will be subject to verification consistent with the following guidelines:

- (1) Type I (Mandatory). This category is assigned to characteristics, which would be classified as critical, if found defective. Verification of this category is mandatory and must be accomplished by evaluating the product and work documentation. Sampling of mandatory characteristics is not permissible. QA Officers at I-level activities must verify BCM interdicted workload identified as having a Type I verification requirement is performed "only" by a QA Specialist.

- (2) Type II (Temporary Mandatory). This category of verification temporarily imposes mandatory verification requirements and may be conducted on high failure rate items, items without objective evidence of good quality, instances where the quality level is suspect or inadequate, or while conducting audits. Temporary mandatory verification may also be imposed and conducted to obtain or verify statistical quality data. Temporary Mandatory verification must be terminated when the acceptable quality level or statistical quality data has been obtained. Artisans assigned to I-level activities will not be expected to inspect an I-level technician's performed maintenance; however, I-level QA personnel must verify the artisan's work when all the following requirements are met:

- (a) Type II requirements established by the FRC are involved.

- (b) The work performed is solely accomplished using an I-level repair manual.
- (c) The I-level has agreed to accept the Type II verification for the D-level repair.

(3) Type III. Sampling and surveillance verifications modes may be used independently or in combination to accomplish the verification function when Type I or Type II is not required.

(a) Sampling verification permits reduced verification emphasis. The end use of the product, relative complexity, and such factors as subsequent verification of product as a "system" is considered.

(b) Surveillance verification allows the use of reduced verification through the application of an effective audit program. Applicable products and processes are those that display objective quality evidence or a state of statistical quality control using SPC techniques.

- e. Products must have an acceptable quality history or be in a state of SPC.
- f. Products selected for surveillance should be systematically audited periodically to verify quality is maintained.
- g. If an adverse trend develops, immediately impose Type II verification while analyzing data. After correction of the root cause, reinstate normal surveillance.
- h. Procedures must be established to verify:
 - (1) Development, implementation, administration, and monitoring of the verification program.
 - (2) Depth of rework decisions provides a product, which will meet all engineering and quality requirements.
 - (3) Progressive review of work documents to verify all previous tasks have been certified or verified.
 - (4) Conformance to the Navy Calibration Program requirements.

7.7.8 Work Definition and Documentation

a. Definitive work documentation must be provided to production and production support personnel to effectively process a FRC D-level's workload.

- b. Work documents provided to certifiers must be:
 - (1) Specific, clear, and complete.
 - (2) Arranged to coincide with the production sequence.
 - (3) Spaced to affix certification and verification stamp imprints, with date of each entry.
 - (4) Include appropriate product serial numbers or other unique identification for traceability purposes.
 - (5) Contain definitive work documentation to conform to authorized technical specifications, identify product and quality characteristics to be certified and, when applicable verified.

c. Completed (certified and, when applicable, verified) aeronautical work documentation must be retained (at a minimum) as follows:

(1) Aircraft - until completion of the next standard depot level maintenance (SDLM) or the subsequent completion of a previously completed phase in the phased depot maintenance (PDM) cycle, for example, Phase 1 records may be destroyed after completion of all other phases and a subsequent Phase 1.

(2) Engines and flight critical safety item components - 2 years.

(3) Non-critical safety item components - 6 months for work documents specifically identified (traceable) to non-critical safety item components transferred from a FRC D-level to a Fleet Industrial Supply Center (FISC). Work documents traceable to components installed in aircraft undergoing processing, such as SDLM or PDM, should be retained at the D-level FRC with aircraft maintenance records.

(4) Aircraft stricken from Navy inventory - 1 year unless special instructions are received from the authority involved with the strike action. The 1-year period will begin on receipt of the initial Class A mishap message or any other strike report.

d. Procedures must be established to:

(1) Develop and maintain workable methods and procedures to verify compliance with directed work definition and documentation.

(2) Perform certification actions on each work task for each completed product and quality characteristics processed prior to requesting quality verification.

(3) Date certification actions on facility designated work documents at the completion of a work document or task.

(4) Revise inadequate work documentation.

(5) Provide definitive manual work documentation. Tasks must be listed separately, capable of being completed in one shift (or less) or in a manner, which permits the certifier to certify the whole task.

(6) Maintain and operate a CTPL.

7.7.9 Quality Characteristics

a. Valid verification of product or process quality requires determining the degree to which the product's inherent or acquired characteristics conform to applicable standards and specifications. To make this determination, product or process characteristics must be adequately identified and documented.

b. Quality characteristics must be integrated on work documentation. Integration of quality characteristics is merely the identification of those product characteristics that:

(1) Provide a predetermined qualitative measurement of stated parameters confirming adherence to standards or specifications.

(2) If improperly performed, could jeopardize personnel safety or cause damage to or failure of equipment.

c. Quality characteristics identified and integrated on work documents must be written clearly and concisely. Quality Assurance and ISSC are the only authorized entities to add or remove quality characteristics.

d. As work progresses, steps performed are subject to verification. Artisans must be required to perform necessary corrective action when work performed does not conform to applicable specifications or when the quality is not acceptable.

e. Safety of flight and critical safety item characteristics.

(1) Type I mandatory verification will be performed on all flight critical characteristics, which are to be integrated into work documents.

(2) Authorization to remove flight critical characteristics from D-level FRC work documents, technical manuals, MRCs, and FCF checklists must be specifically approved in writing by the aircraft ISSC.

7.7.10 Quality Audits and Investigations

a. Quality audits and investigations are essential tools used to comprehensively evaluate factors and conditions affecting product or process quality. They identify potential problems, opportunities for improvement, and stimulate root cause corrective or preventive actions. The objective of quality audits and investigations is continuous improvement of a system or process.

b. Quality audits are independent reviews conducted to compare some aspect of performance with set quality standards for that performance. Audits are usually conducted on a regularly scheduled basis and must not be conducted solely as a crisis response.

(1) Quality audits encompass specific products, processes, systems, and facilities. They may be shop, area, or command-wide and are normally scheduled in advance. Audit frequency must be based on urgency and may be adjusted by the results and statistical defect trend analysis or other quality feedback. Audits may vary in depth and scope as determined by objective quality history and product complexity. Procedures must be established to:

(a) Maintain quality audit records.

(b) Verify follow-ups are conducted on all documented concerns.

(c) Provide written corrective and preventive actions on documented deficiencies within specified time frames.

(2) Quality investigations are conducted when a known or perceived problem exists. Quality investigations must be used for the identification, correction, and prevention of conditions that degrade the quality or reliability of products, processes, or systems.

c. Any area affecting quality is subject to a quality audit. Audits may be requested by other FRC D-level departments or higher echelon activities. Quality audits may be conducted by one or more persons depending upon the depth, scope, and complexity. Expert assistance may be requested from other departments as required. Specific written guidelines and standards must be used to define the audit process.

d. The quality investigation is the primary tool for resolving customer reported problems and must be conducted in sufficient depth to identify all deficiencies and verify the problem is not repeated.

7.7.11 Quality Analysis

a. Analysis is an essential part of the DLQP. Effective analysis of data from reliable sources is required to understand the system and make decisions for continuous improvement. It requires creativity, initiative, and sensitivity by management if benefits are to be derived. Analysis will provide management with information concerning:

- (1) Process capability.
- (2) Degree of product conformance.
- (3) Source of variation.
- (4) Causes of nonconformance.
- (5) Corrective action required to eliminate or at least minimize variation.
- (6) Methods to achieve continuous improvement.

b. The diagnosis of reasons why products fail is required for defect prevention. Equally vital is evaluation and validation of preventive actions. Acceptance of this premise is essential for improved quality, productivity, and reduced costs.

c. Maximize the use of computerized data processing systems.

d. Develop and maintain a database to include internal and external reports and records on product and process quality data.

e. Review and analyze the quality database to:

- (1) Monitor the effectiveness of quality programs.
- (2) Create constancy of purpose by continually striving to improve quality of products and processes.

f. Provide quality data trends and status reports to advise management and other personnel on the quality and reliability of products, processes, and systems.

g. Recommend corrective and preventive actions following investigation and analysis.

h. Conduct follow-ups to determine the adequacy or effect of implemented corrective and preventive action(s).

i. Maintain training in statistical techniques and analysis functions for management and personnel at all levels.

7.7.12 Quality Cost

a. For management to gain a clear picture of the D-level FRCs quality effectiveness and the total cost incurred when a product is reworked, it is necessary that the quality cost component be identified and analyzed. When the magnitude of the quality costs are known, management policies can be initiated that will not only reduce overall rework costs, but will do so at a higher quality level. Dual benefits, decreased costs, and increased quality are achieved because of the relationship between the three categories, which

comprise quality costs. These categories are Failure Costs, Appraisal Costs, and Prevention Costs as defined by COMNAVAIRSYSCOM (AIR-6.0).

b. The responsibility to control quality cost is facility wide. Determination of quality cost is not only desirable, but is an absolute necessity for management to appreciate the interaction of workload, production, and quality.

c. All D-level FRCs must verify a comprehensive quality cost program is developed, implemented, and administered. At a minimum, procedures must be established to:

- (1) Verify accurate transaction accounting.
- (2) Identify and eliminate hidden cost areas associated with the quality function.
- (3) Recommend and implement methods to identify and to optimize quality cost.

7.7.13 Corrective and Preventive Action

a. Corrective action is the resolution of a problem or deficiency. Corrective action must remedy the cited deficiency and inhibit recurrence by identifying and eliminating its root causes. Corrective action must be appropriate to the effects of the non-conformances encountered.

b. Preventive action eliminates the cause of potential non-conformances in order to prevent their occurrence. Preventive actions must be appropriate to the effects of the potential problems.

NOTE: The Electronic Continual Analysis and Metrics (eCAM) information technology system must be used to document corrective and preventive actions per [Chapter 12](#).

c. A continuous and vigorous corrective and preventive action program must be established that includes the analysis of internal and external data. A corrective action must be required when a deficiency is detected in a D-level product, process, or system or when the services or products are found to be deficient in a command which the D-level has an existing support agreement.

d. The organization must take corrective action to eliminate the cause of non-conformances in order to prevent recurrence. When deficiencies are reported, prompt corrective and preventive action must be accomplished without compromising product, process, or system quality. Documented procedure requirements must be established to:

- (1) Review and determine the causes of non-conformances (including customer complaints).
- (2) Evaluate the need for action to verify that non-conformances do not recur.
- (3) Determine and implement actions needed.
- (4) Review corrective action taken.
- (5) Maintain records of the results of action taken.
- (6) Flowing down the corrective action requirement to a supplier when it is determined that the supplier is responsible for the non-conformance.
- (7) Determine specific actions where timely and effective corrective actions are not achieved.
- (8) Obtain ISSC or FST risk assessment of non-conforming products.

(9) Determine if additional non-conforming product(s) exists, based on the non-conformance causes and take action, when required.

(10) Evaluate the need for action, based on human factors to verify that non-conformances do not recur.

e. Repetitive deficiencies must be brought to the attention of increasingly higher levels of management until the root cause is eliminated.

f. The organization must determine preventive action required to eliminate and prevent the occurrence of potential non-conformances. Documented procedures must be established to define requirements to:

- (1) Determine potential non-conformances and their root cause.
- (2) Evaluate the need for action to prevent occurrence of non-conformances.
- (3) Determine and implement action needed.
- (4) Maintain records of results of action taken.
- (5) Review preventive action taken.

(6) Evaluate the need for action based on human factors to prevent occurrence of non-conformances.

NOTE: Processes that are potential sources of preventive action opportunities include risk management, error proofing, failure mode and effect analysis, Human Factors Analysis and Classification System, and Naval Aviation Maintenance Discrepancy Reporting Program (NAMDRP).

g. Deficiencies are classified as critical, major, or minor.

(1) A critical deficiency defect is likely to result in hazardous or unsafe conditions for individuals using or maintaining it. Depending on the product, the defect may prevent functional performance of an aircraft, missile, space vehicle, or major component.

(2) A major deficiency defect is likely to result in the failure or reduced material utility of a unit or product.

(3) A minor deficiency defect is not likely to materially reduce the utility of a unit or product or has little bearing on the use or operation of a unit.

(4) Systems for internal and external quality data collection and analysis must be implemented and maintained.

(a) Discrepancy work orders (DWO) within quality assurance workbench (QAWB) NAVAIR Depot Maintenance System (NDMS) business processes document internal product deficiencies. An in-process or reprocess document must be initiated whenever a certified product or process is found to be specification deficient.

1. In-process is a certified task or operation found to be specification deficient within the certifying shop.

2. Reprocess is a certified task or operation, not classified as in-process, found to be deficient. For example, a certified product routed from the certifying shop or requiring certifiers from another area to correct the deficiency, or a certified product found defective in a shop other than the certifying shop.

(b) Process Correction Reporting System is an automated system for the collection of procedural deviations and deficiencies.

(c) External Correction Reporting System is an automated system for the collection of customer reported deficiencies.

7.7.14 Customer Liaison Program

a. The Customer Liaison Program is established to verify the customer receives a product that meets their needs and requirements. Each FRC D-level activity must maintain a Customer Liaison Program that provides on-site contact with its customers, establishes communication links, and encourages customer feedback.

b. It is the FRC D-level activity's responsibility to verify products conform to specifications and support is provided through education, training, and other assistance. Constructive relationships between D-level activities and their customers are an essential link in the AIRSpeed process. Customer satisfaction is the ultimate goal of each D-level activity. Customer feedback is one of the primary means of measuring productivity effectiveness and product quality.

7.7.15 Contracting

a. The increased emphasis on contracting activities requires the establishment of uniform guidelines and procedures to control quality and verify compliance with Federal Acquisition Regulations, military specifications, and military standards when soliciting contracts.

b. Contracting for services and supplies requires the cooperation of all departments to verify accurate contract definition, cost analysis, and development of effective quality requirements. Incorporation of this principle will result in effective contract administration and assurance of quality services and supplies.

c. Prior to bid solicitation, proper consideration should be given to:

- (1) Appropriate military specifications and military standards.
- (2) Accurate service and supply definitions.
- (3) Organizational efficiency considerations.
- (4) Timetables for services and delivery of supplies.
- (5) Quality requirements.
- (6) Material requirements.
- (7) Facility requirements.
- (8) Manpower requirements (including special skills and qualifications).

7.7.16 Quality Training

- a. The FRC D-level command recognizes the continual need for satisfying new technical and product requirements by providing training on the latest state-of-the-art processes, techniques, and procedures.
- b. Continuous training that agrees with the concepts and philosophies of AIRSpeed must be given to all FRC D-level personnel who directly or indirectly affect the quality of products produced.
- c. FRC D-level activities will verify their personnel are thoroughly trained in the functional responsibilities and performance of their duties within the DLQP.

7.7.17 Aircraft Battle Damage Repair (ABDR)

ABDR is performed only under combat conditions. Personnel from all maintenance levels use temporary, innovative repair techniques to restore combat capability in a short timeframe using substitute materials and procedures approved by applicable ISSC. ABDR recognizes other than "factory standard" specifications and relies primarily on technicians and equipment currently available within the battle zone and as augmented by D-level ABDR personnel.

7.7.18 Other Programs and Reports

Personnel assigned responsibility for the quality function(s) must verify the effectiveness of cognizant programs and reports in other chapters of this instruction. These programs and reports include, but are not limited to:

- a. Aircraft Discrepancy Reporting.
- b. Quality Deficiency Reporting.
- c. Special Process Certification Licensing Program.
- d. Vibration Analysis Program.

7.7.19 Safety

The FRC D-level activity Safety Department is staffed and equipped to effectively manage general safety, environmental, and OSH programs, to include those inspections and training actions designed to verify an effective command safety posture and promote continuous awareness and compliance with fire and safety regulations. Additional D-level responsibilities may be addressed by local instructions.

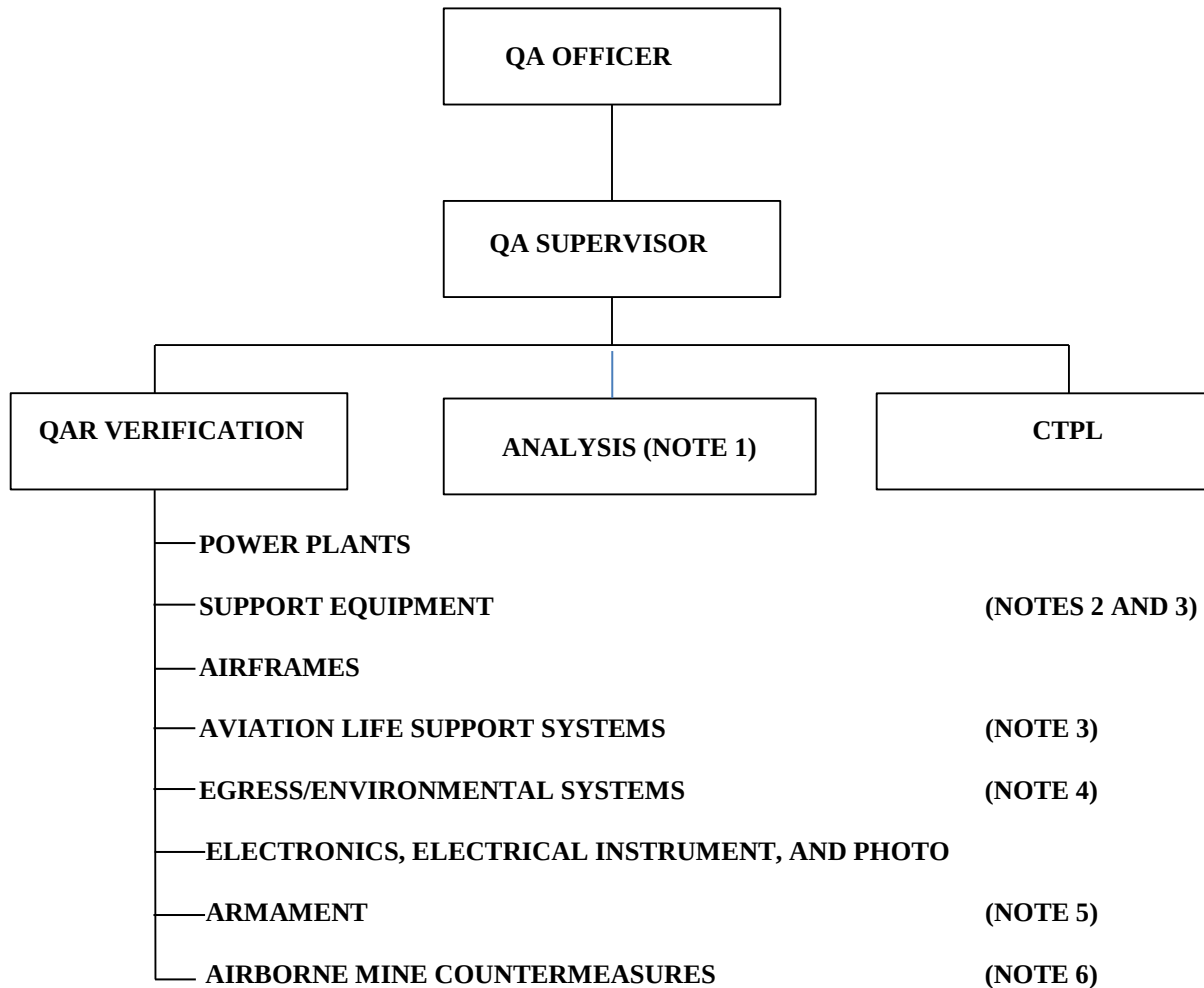
7.7.20 Fleet Engineering Disposition (FED) Repairs.

For FED repairs containing tasks requiring a D-level artisan, the ISSC engineering authority must note the D-level requirements and route through the cognizant D-level QAS for approval prior to releasing the disposition to the I-level activity, per [Chapter 3](#).

7.7.21 FRC D-level Support Equipment (SE) Misuse and Abuse reporting procedures.

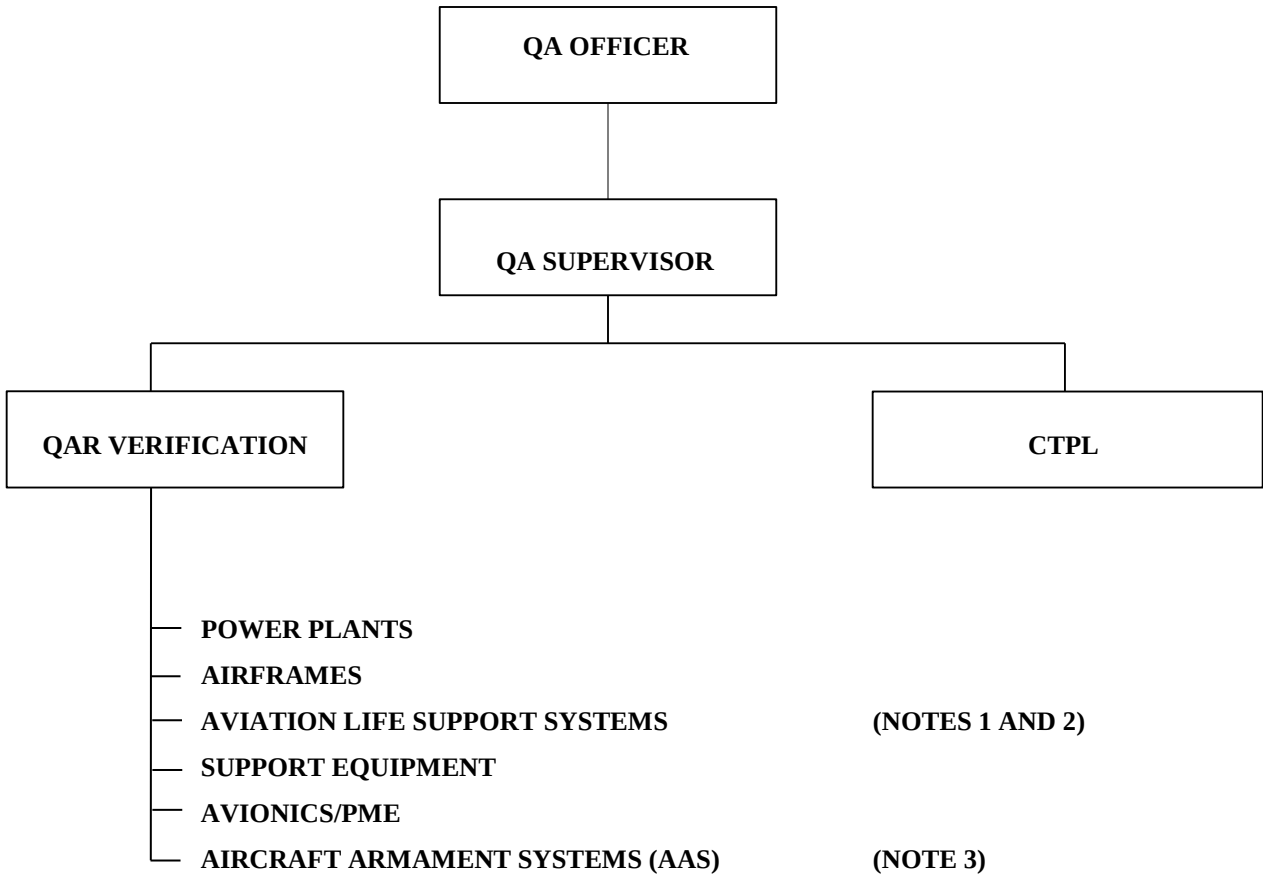
- a. FRC D-level activities may elect to use the SE Misuse/Abuse Form (OPNAV 4790/108) ([Figure 7-7](#)), or develop their own form that contains, at a minimum, all data elements required by the OPNAV 4790/108.
- b. The FRC D-level activity's QA will conduct an investigation to determine the root cause of the occurrence and provide recommendations for corrective action to the CO.

- NOTES:**
- 1. If the misuse or abuse resulted in a personnel mishap, QA must coordinate with the industrial OSH Department. QA will forward the SE Misuse/Abuse Report to the manager or subcustodian (project lead) of the equipment and to the review board (if established) of the command where the misuse or abuse occurred. Completion is expected within 10 days.**
 - 2. The FRC D-level activity CO may establish a review board to assess QAs corrective action plan for adequacy and to follow-up on the implementation. On satisfactory follow-up, the review board will incorporate their results into the Comments section of the report and close the report out.**
 - 3. If the offender belongs to another command, QA must forward a copy of the completed report to the parent command.**



- NOTES: 1. Analysis section only required if not operating OOMA. [Chapter 5](#) lists responsibilities.
2. Required only if operating an SE Division.
3. May be a CDQAR.
4. Required for ejection seat aircraft only.
5. O-level activities with minimal ordnance delivery in assigned mission may designate a CDQAR.
6. Only in HM squadrons.

Figure 7-1: O-level Maintenance Activity QA Organization

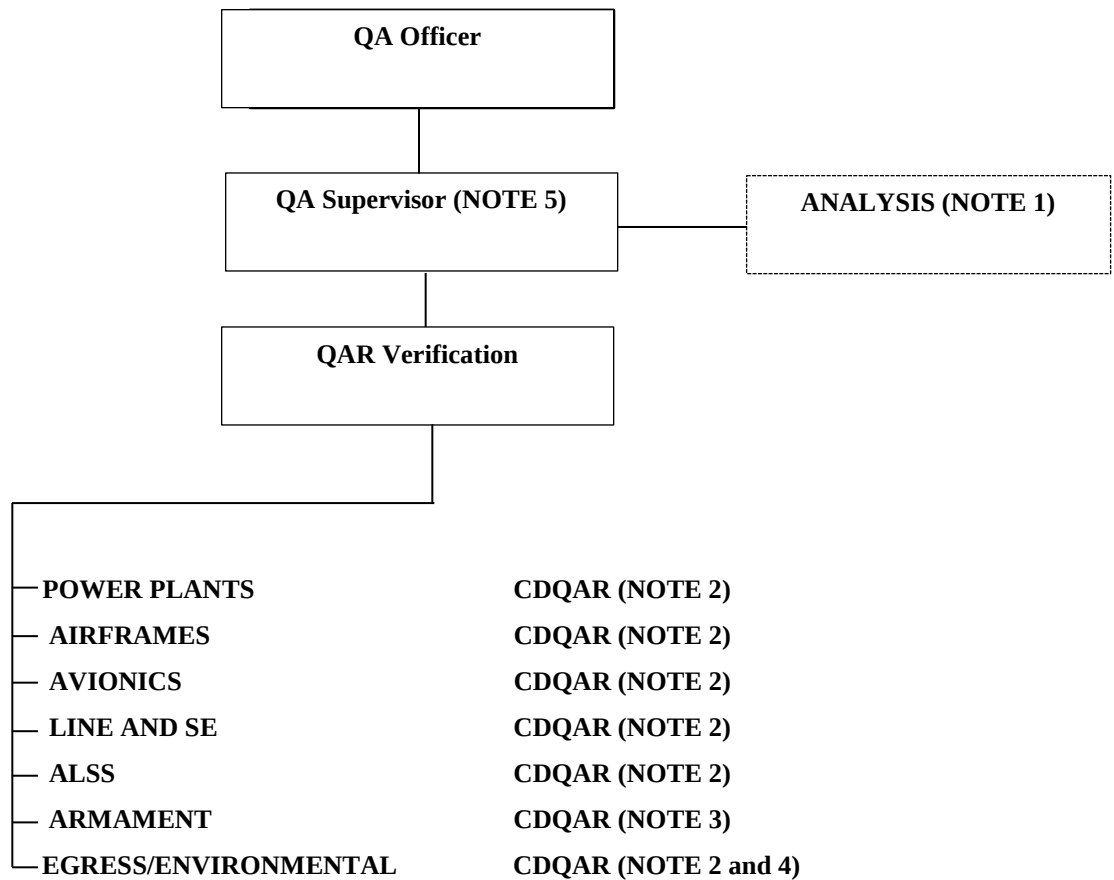


NOTES: 1. Oxygen and nitrogen generating facilities must designate a CDQAR for oxygen and nitrogen generating related QA functions.

2. I-level activities not supporting parachutes or oxygen systems may designate an ALSS CDQAR.

3. I-level activities having minimal AAS workload in assigned mission may designate an AAS CDQAR.

Figure 7-2: I-level Maintenance Activity QA Organization



TECHNICAL PUBLICATIONS LIBRARY (ASSIGNED COLLATERAL DUTY TO OTHER STAFF DIVISION

NOTES: 1. Analysis section required only if not operating OOMA. [Chapter 5](#) lists responsibilities.

2. Permanent assignments.

3. Only those activities whose assigned mission includes handling and delivery of ordnance other than cartridge activated devices or small arms.

4. Required for activities with ejection seats.

5. The QA supervisor will be assigned as Maintenance Department Safety Coordinator.

Figure 7-3: QA Organization for Operations Maintenance Department (OMD) and Permanent or Temporary Detachments with Four or Less Aircraft

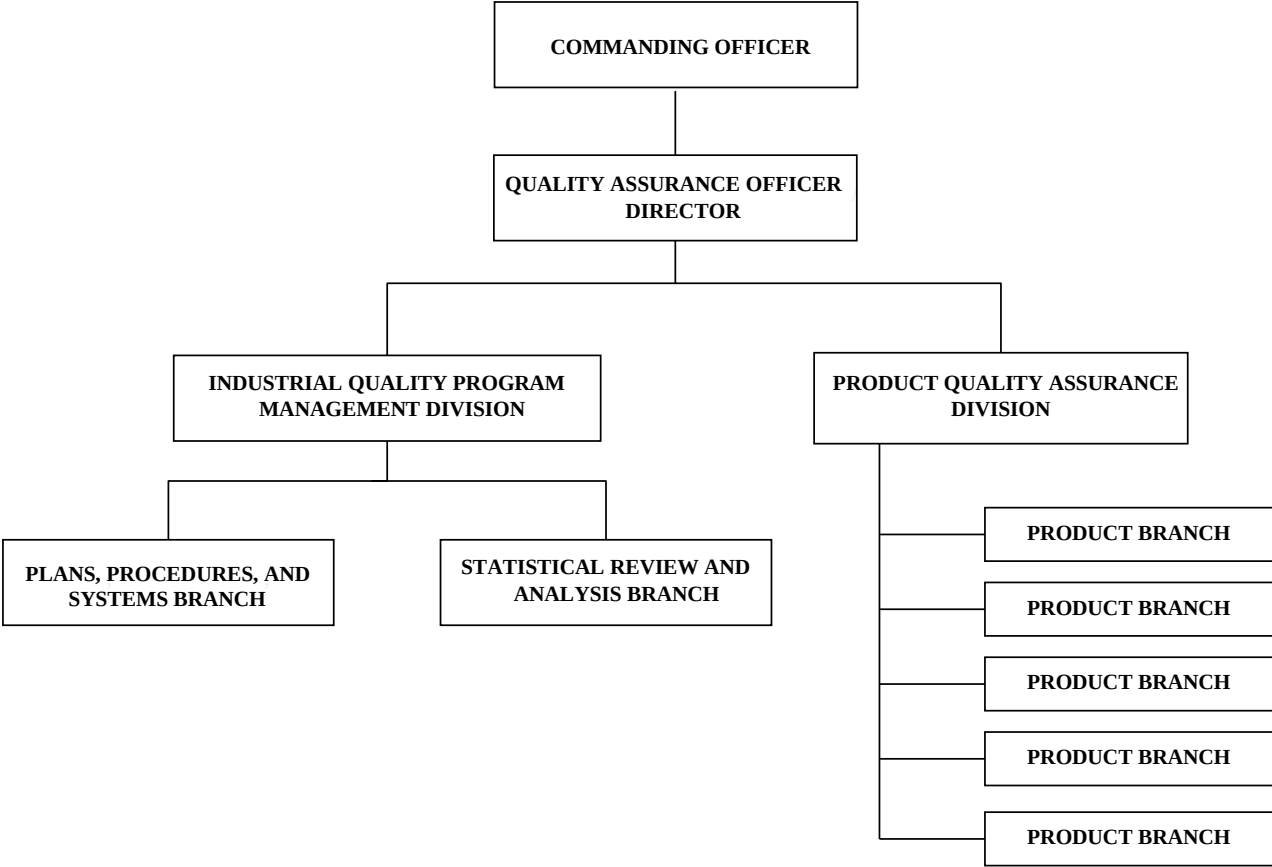


Figure 7-4: D-level Activity QA Organization

QUALITY ASSURANCE REPRESENTATIVE/INSPECTOR DESIGNATION			
CANDIDATE NAME (Last Name, First Name, Middle Initial):			RATE/GRADE:
I. <u>DIVISION OFFICER RECOMMENDATION</u>			
In accordance with the current COMNAVAIRFORINST 4790.2 the above named person is recommended for:			
<input type="checkbox"/> QAR <input type="checkbox"/> CDQAR <input type="checkbox"/> CDI			
FOR (Aircraft/System/Work Center/Etc.):			
DIVISION OFFICER TYPED NAME AND RANK:	SIGNATURE DATE:	DIVISION OFFICER SIGNATURE:	
II. <u>QUALITY ASSURANCE ANALYSIS OFFICER ENDORSEMENT</u>			
The candidate has been examined in accordance with the current COMNAVAIRFORINST 4790.2 and has passed all requirements satisfactorily. Recommend approval.			
QA/A OFFICER TYPED NAME AND RANK:	SIGNATURE DATE:	QA/A OFFICER SIGNATURE:	
III. <u>MAINTENANCE OFFICER ENDORSEMENT</u>			
Candidate is fully qualified in accordance with the requirements of COMNAVAIRFORINST 4790.2. Recommended for designation for the specified Quality Assurance Representative/Inspector position.			
MAINTENANCE OFFICER TYPED NAME AND RANK:	SIGNATURE DATE:	MAINTENANCE OFFICER SIGNATURE:	
IV. <u>COMMANDING OFFICER ACTION</u>			
<input type="checkbox"/> DESIGNATED <input type="checkbox"/> NOT DESIGNATED			
COMMANDING OFFICER TYPED NAME AND RANK:	SIGNATURE DATE:	COMMANDING OFFICER SIGNATURE:	
V. <u>DESIGNEE ACKNOWLEDGEMENT</u>			
I UNDERSTAND MY RESPONSIBILITY AS SET FORTH HEREIN			
<p>"When performing inspection, I am considered to be the direct representative of the Commanding Officer for ensuring safety of flight of the item concerned. I will not permit factors, such as operational desires, maintenance consideration, personal relations or the approach of liberty to modify my judgment. By signing an inspection report, I am certifying upon my own individual responsibility that the work involved has been personally inspected by me; that it has been properly completed and is in accordance with current instructions and directives; that it is satisfactory; that any related parts or components which may have been removed by the work are properly replaced and all parts are secure, and that the work has been performed in such a manner that the item is completely safe for flight or use"</p>			
CANDIDATE TYPED NAME AND RANK:	SIGNATURE DATE:	CANDIDATE SIGNATURE:	STAMP NO.:

OPNAV 4790/12 (REV 10/2016)

Original to: Individual
Copy to: Quality Assurance/Analysis Officer
Division Officer

Figure 7-5: Quality Assurance Representative/Inspector Recommendation/Designation (OPNAV 4790/12)

Y- Code Report Number:

Date:

A. AMSU Action: Notify Quality Assurance and Production Control.

B. Quality Assurance Action: Screen component and documents, determine Y-Code validity, and assign report number.

Previous JCN: _____ Previous BUNO: _____ Previous Meter: _____
Previous Discrepancy: _____

Previous Corrective Action: _____

Date Last RFI: _____ Previous CDI/CDQAR/QAR: _____

C. AMSU Action:

Work Center:
P/N: _____ S/N: _____ WUC:
Nomenclature: _____ BUNO: _____ Meter:
JCN: _____ MCN: _____ DDSN:
Discrepancy: _____

D. Work Center Action:

Present Corrective Action (List specific details): _____

Technician: _____ CDI: _____ W/C Supervisor: _____

E. Quality Assurance Action: Retain this completed form for one year.

QA action taken to prevent reoccurrence: _____

QAR: _____ QA Officer: _____

F. Forward copy of completed form to inducting activity QA and last processing activity (if different).

Figure 7-6: Y-Code Process

SUPPORT EQUIPMENT MISUSE/ABUSE		CONTROL NO.:	
FROM:		TO:	
THE FOLLOWING INFORMATION IS SUBMITTED IN REGARDS TO A REPORT OF MISUSE/ABUSE:			
PERSON WHO MISUSED/ABUSED EQUIPMENT	NAME:	RANK/RATE:	
	ORGANIZATION/UNIT:	SE LICENSE NO.:	
		GOVT OPERATOR LICENSE NO.:	
LOCATION AND EQUIPMENT INVOLVED	LOCATION:	TYPE EQUIPMENT PN/FSN:	TIME:
		EQUIPMENT SERIAL NO.:	DATE:
			JCN:
NARRATIVE DESCRIPTION:			
PERSON CITING MISUSE/ ABUSE	NAME:	RANK/RATE:	
	ORGANIZATION/UNIT:		
WAS SE LICENSE CONFISCATED? IF YES, LICENSE IS BEING HELD BY:	YES	NO	REMARKS:
SIGNATURE AND TITLE OF REPORTING OFFICIAL:		DATE:	

Figure 7-7 (front): Support Equipment Misuse/Abuse (OPNAV 4790/108)

OPNAVINST 4790.2
COMNAVAIRFORINST 4790.2
OPNAV M-8000.16

FIRST ENDORSEMENT	DATE
FROM:	
TO:	
VIA:	
SUBJ: MISUSE/ABUSE	
ACTION TAKEN / RECOMMENDATIONS:	
SIGNATURE AND TITLE:	

Figure 7-7 (back): Support Equipment Misuse/Abuse (OPNAV 4790/108)

ARTISAN INSPECTOR DESIGNATION		
PART 1 - REQUEST		
1. ARTISAN INSPECTOR'S NAME:	2. RATE/GRADE:	3. PAY NUMBER:
4. DEPARTMENT/DIVISION:	5. AIRCRAFT T/M/S:	6. TRADE:
I certify that I understand my responsibilities as set forth in the current Artisan Inspector (AI) Standard Operating Procedures (SOP)		
7. SIGNATURE OF ARTISAN INSPECTOR:		8. SIGNATURE DATE:
PART 2 - PROGRAM MANAGER		
I certify the above named individual is qualified as documented in the Individual Qualification Record (IQR) to concurrently certify tasks noted in their IQR		
9. PROGRAM MANAGER'S NAME:		10. CODE:
11. SIGNATURE OF PROGRAM MANAGER:		12. SIGNATURE DATE:
PART III - DIRECTOR OF QUALITY		
I certify the above named individual has successfully completed formal training in Quality Policies and Procedures, and On the Job Training (OJT) in inspection techniques with a qualified Q/A Specialist/Instructor.		
13. DIRECTOR OF QUALITY'S NAME:		14. CODE:
15. SIGNATURE OF DIRECTOR OF QUALITY:		16. SIGNATURE DATE:
PART IV - COMMANDING OFFICER'S APPROVAL		
This letter designates the above named person as a qualified Artisan Inspector(AI) authorized to inspect and concurrently certify all product tasks documented in his/her IQR.		
17. COMMANDING OFFICER'S NAME:		18. CODE:
19. SIGNATURE OF COMMANDING OFFICER:		20. SIGNATURE DATE:

OPNAV 4790/193 (REV 10/2016)

Original to: Inspector's Individual Qualification Record
 Copy to: Program DPM/ A/Q Branch Office

Figure 7-8: Artisan Inspector Designation (OPNAV 4790/193)