

## Attachment 2 Personnel Qualifications

(a) **SECURITY CLEARANCE REQUIREMENTS** - All "Key" Positions shall be held by personnel with at least a SECRET Clearance. Individuals in other positions may be required by individual task orders to possess a SECRET or higher level clearance depending upon the type of work to be performed and the potential exposure to classified material.

(b) **GENERAL CITIZENSHIP REQUIREMENTS** - The Program Manager and Project Managers shall be US citizens. All personnel that the contractor assigns to work on the contract shall be citizens of the United States except for foreign nationals hired, with the permission of the contracting officer, to provide support (transportation, lodging assistance, local warehouse management, etc.) for installations outside of the United States.

(c) **EDUCATION REQUIREMENTS AND ACCREDITATIONS** - To ensure that postsecondary education possessed by individuals meet an acceptable level of quality, educational degrees shall come from accredited institutions or programs. See [www.ed.gov](http://www.ed.gov) for more accreditation information. At a minimum, to receive credit for a Master's and Doctorate, all degrees shall come from an institution that has been regionally accredited by one of the six associations: MSA, NASC, NCA, NEASC, SACS, and WASC. Bachelor's of Science (BS) or Associate's (AS) degrees in Applied Science, Computing, Engineering, and Technology shall be from an a United States institution accredited by an accrediting agency or state approval agency recognized by the U.S. Secretary of Education as a "reliable authority as to the quality of postsecondary education" (See <http://ope.ed.gov/accreditation/>.) or an institution outside of the United States accredited by the equivalent agency for accreditation in the institution's country of origin. Technology degrees do not qualify as Engineering or Physical Science Degrees.

(d) Additional Certifications may be required and specified at the Task Order / Delivery Order level in accordance with specific job skills requirements.

(e) For software engineers and naval architects, higher education above a labor category's minimum can be credited as years of experience as long as the higher degree is within one of the fields of study listed as acceptable for the bachelor's degree requirement. The following educational credit applies: a MS degree equals two (2) years of experience and a PhD degree equals five (5) years of experience.

(f) **LOGISTICS LABOR CATEGORIES** - DAWIA Certification for Contractors – Contractor personnel that do not have government DAWIA certification courses may demonstrate an equivalency in terms of academic degrees, courses completed, and experience as that of their counterparts in the DAWIA workforce. Equivalency for the following classes must be provided as follows: Level 1 - (1) Fundamentals of Systems Acquisition Management, (2) Acquisition Logistics Fundamentals, (3) Systems Sustainment Management; Level 2 – (1) Level 1 classes, (2) Intermediate Systems Acquisition, (3) Intermediate Acquisition Logistics, (4) Performance Based Logistics; Level 3 – (1) Level 1 and 2 Classes, (2) Executive Life Cycle Logistics Management, (3) Reliability and Maintainability. Additional explanation of courses or requirements can be found at the Defense Acquisition University web site (<http://www.dau.mil/>).

(g) **IA/IW LABOR CATEGORIES PERFORMING WORK FOR DOD** - Contractor personnel supporting Information Assurance (IA) functions shall be certified prior to being engaged in IA related work and be in full compliance with DoD 8570.1-M and DoDD 8570.1 This includes personnel being certified/accredited at the appropriate levels of IAT I-III and IAM I-III as appropriate. This will be verified by the contracting officer who will ensure that contractor personnel are entered in to the Defense Eligibility Enrollment System (DEERS) or other appropriate database. Contractor personnel not certified within 6 months of assignment of IA duties or who fail to maintain their certified status will not be permitted to carry out the responsibilities of the position, and shall be replaced with a contractor who does meet the minimum certification requirements as mandated above.

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(h) **EXPERIENCE REQUIREMENTS** - Listed experience requirements in this document can be met by using concurrent experience unless it is expressly stated that they cannot be. Listed experience requirements are all minimum requirements. Experience shall be paid work experience unless the requirement states that classroom experience or other unpaid experience is allowed.

(i) **DEFINITIONS**

- **Above Ground Outside Plant (OSP) Cabling Infrastructure:** The portion of a cabling infrastructure installed outside of buildings and above ground. It typically includes utility poles (telephone poles), messenger wire, risers (vertical conduits with cable inside), weather heads, and associated items.
- **C4ISR:** Command, Control, Communications, Computing, Intelligence, Surveillance and Reconnaissance
- **Underground Outside Plant (OSP) Cabling Infrastructure:** The portion of a cabling infrastructure installed outside of buildings and underground. It typically includes underground cable, conduits, innerduct, manholes, handholes, and associated items.
- **Working Level Experience:** Experience gained while working in a non-supervisory capacity
- **Managing Work:** Being responsible for budgeting and planning work, assigning tasks to other personnel, monitoring the work performed by others, and initiating corrective action when required.
- **Licensed Professional Engineer:** An engineer formally licensed and registered to practice an engineering specialty by one of the states, commonwealths, or territories of the United States of America.

**1. Program Manager (Key)**

**Experience:** Fifteen (15) years of technical experience in planning and executing the installation, and testing and support of Command, Control, Communications, Computing, Intelligence, Surveillance and Reconnaissance (C4ISR) systems. This experience shall include:

- a. Eight (8) years of experience in managing the design, implementation, inspection, testing, and completion of C4ISR system installation efforts. Of this experience, a minimum of three years experience must have been in managing installations aboard US Navy ships/submarines and a minimum of three years must have been in managing installations at shore facilities. In addition, at least five years of experience in managing sub-contracting requirements is required.
- b. Five (5) years experience in coordinating proposals, developing cost estimates, and budgeting for C4ISR installation work.
- c. Five (5) years experience in demonstrating the ability to coordinate and interface with Government personnel (military/civilian), contractors, and sub-contractors in the field of C4ISR installations.
- d. Four (4) years of working level experience in developing and implementing installation designs and in testing and inspecting completed installations.

**Knowledge, Skills and Abilities:** When called for by the demands of the position, holders of this position shall be able to demonstrate that they can:

- a. Keep track of the general status of the major ongoing tasks being performed by the contractor.
- b. Clearly determine and communicate detailed status information for all ongoing installation projects.
- c. Maintain an awareness of the quality of the work being performed and must be able to implement whatever corrective action is needed to meet acceptable quality limits.
- d. Ensure that tasks are assigned to individuals who can be expected to meet quality, cost, and schedule commitments made by the contractor.
- e. Ensure that tasks are provided with adequate resources (personnel, time, tools, test equipment, training, etc.) to meet cost and schedule commitments.
- f. Develop an effective program for training personnel and developing and documenting effective and efficient work practices – including program management and quality assurance practices.
- g. Implement an effective Management Information System to track costs, schedules, quality, and Government Property (both contractor and Government furnished).
- h. Utilize Microsoft Project or equivalent software that can produce Microsoft Project compatible files for project management
- i. Train junior personnel in financial tracking, cost estimation, and installation execution methods and requirements.
- j. Interpret and review engineering drawings, test plans, and technical specifications and provide clear text descriptions of the errors found and the clear identification of any standards violations.

**Note: This position is required to be filled by Contract Statement of Work (SOW) Section 4.1, Program and Project Management.**

**2. Project Manager**

**2a. Surface Ship Project Manager (KEY)**

**Experience:** Ten (10) years of direct work experience with surface ship C4ISR installations that includes:

- a. Eight (8) years of direct work experience in managing or performing the design, implementation, testing, inspection, logistics, resource management, and completion of C4ISR system installation efforts for US Navy surface ships
- b. Four (4) years as manager of shipboard installation projects involving multiple systems and in performing tasks to include: Supervising Project Personnel, Scheduling Work, Writing Proposals and Preparing Bids, and Equipment and Material Logistics Control.

**Knowledge:** Knowledge of Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

**2b. Submarine Project Manager (KEY)**

**Experience:** Ten (10) years of direct work experience with submarine C4ISR installations that includes:

- a. Eight (8) years of direct work experience in managing or performing the design, implementation, testing, inspection, logistics, resource management, and completion of C4ISR system installation efforts for US Navy submarines.
- b. Four (4) years as manager of submarine installation projects involving multiple systems and in performing tasks to include: Supervising Project Personnel, Scheduling Work, Writing Proposals and Preparing Bids, and Equipment and Material Logistics Control.

**Knowledge:** Knowledge of Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

**2c. Shore Project Manager (KEY)**

**Experience:** Ten (10) years of direct work experience with shore C4ISR installations. Eight (8) years of direct work experience in managing or performing the design, implementation, testing, inspection, logistics, resource management, and completion of C4ISR system installation efforts for Department of Defense shore sites. Four (4) years as manager of U.S. Navy shore installation projects involving multiple systems and in performing tasks to include: Supervising Project Personnel, Scheduling Work, Writing Proposals and Preparing Bids, and Equipment and Material Logistics Control.

**Knowledge:** Knowledge of Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

**3. Engineer/Scientist 4**

**3a. Shipboard Project Engineer**

**Education:** BS degree in Engineering

**Experience:** Ten (10) years of experience as project lead, responsible with: structuring, supervising, and coordinating projects of numerous ship classes in a shipboard environment, to include: Systems Analysis, Systems Architecture, Systems/Equipment Support, Test and Evaluation, and Logistics support of projects. Six (6) years of experience in shipboard engineering, fabrication, and installation. Specific experience: directing project assignments, overseeing various project teams in day-to-day activities, generating descriptive project work plans, defining work techniques, assisting with contractor employee evaluations, managing total ship integration (i.e., system installations, system/equipment modifications, engineering design, fabrication, technical evaluations, System Operation and Verification Tests (SOVTs) and providing Integrated Logistics Support (ILS)). Five (5) years experience in the use of project management tools, program implementation, and planning methodologies to include financial tracking, cost estimation, and Alteration Installation Team (AIT) execution. Five (5) years of experience in performing engineering evaluations/analyses; reading, interpreting, and reviewing engineering drawings; and working from drawings, manuals, handbooks and technical specifications. Must have experience in utilizing at least six of the following kinds of test equipment: Bit-error rate test sets, Optical Time Domain Reflectometers (OTDRs), AC power analyzers (one phase required, 3-phase preferred), Multimeters (or separate voltmeter, ammeter, and resistance meters), Clamp-on ammeters, VSWR meters, Storage oscilloscopes, Optical Loss Test Sets, LAN Cable Certification Test Sets (e.g., Cat 6 Cable Certification Test Sets), Network Analyzers for Ethernet networks, Spectrum Analyzers, and Humidity meters.

**3b. Internet Protocol (IP) Network Systems Design Engineer, Level 4**

**Education:** A person qualifying for this position shall currently possess one of the following:

- a. Cisco Certified Internetwork Expert (CCIE) certification
- b. A Cisco Certified Network Professional (CCNP) certification and a Microsoft MCSE certification
- c. A CCNP certification with ten (10) years of networking experience networking experience as described below
- d. Both a Cisco CCNA certification and a Microsoft MCSE credential with fifteen (15) years of networking experience as described below
- e. A bachelor's of science degree in Computer Science, Management Information Systems, Engineering, or Mathematics and a CCNA or MSCE certification with ten (10) years of networking experience as described below

**Networking Experience:** Personnel qualifying for this position shall have at least eight (8) years of experience designing, installing, configuring and troubleshooting local and wide area Internet Protocol (IP) networks with an average of 100 or more users. Experience must include configuration of at least ten of the following and all of the following with an asterisk:

- a. Cisco routers\*
- b. IP switches\*
- c. Virtual Private Network Devices\*
- d. Firewalls\*
- e. Windows Servers\*
- f. Unix/Linux Servers
- g. Microsoft Exchange E-mail servers\*
- h. Domain name servers
- i. Intrusion detection/prevention devices
- j. Network management devices
- k. Network storage devices (includes SAN switches)
- l. Packet shapers

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall be able to demonstrate excellent skills in the following areas:

- a. Developing performance testing procedures for IP network throughput performance and network security
- b. Providing full network configuration documentation that will enable Navy civilian and military Information Technology professionals to reconstitute any portion of the Network after any group of hardware failures
- c. Microsoft Exchange Server configuration and troubleshooting
- d. Microsoft Windows Server configuration troubleshooting
- e. Cisco Router and Switch configuration and troubleshooting

**3c. Shore Antenna Installation Project Engineer, Level 4**

Those qualifying for this position must possess the qualifications for an Engineer/Scientist 3 (Level 3) Inside Plant (ISP) Project Engineer and the following additional requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. Six (6) years experience developing shore Installation Design Plans for – and managing – projects involving both transmitting and receiving antenna installations
- b. Six (6) years of experience preparing documents for, conducting, and performing System Operational Verification Tests (SOVTs) on systems that include antennas
- c. Three (3) years of experience developing detailed cost estimates for installations involving at least six different physical kinds (e.g., parabolic dish, Yagi, dipole, whip, microstrip patch, etc.) of antennas

**Knowledge:** Antenna installation Project Engineers shall meet the knowledge requirements for Level 3 Shore Antenna Installation Project Engineers.

**Skills and Abilities:** To be qualified as an antenna installation Project Engineer at this level, personnel must possess the skills and abilities required at level 3 for this position and must be

willing and able to supervise and train others to meet Shore Antenna Installation Project Engineer Level 3 requirements.

**3d. Shore Outside Plant Cabling Infrastructure Installation Project Engineer, Level 4**

Those qualifying for this position must possess the qualifications for a Level 3 Inside Plant (ISP) Project Engineer and the following **additional** requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. Six (6) years experience as developing shore Installation Design Plans for underground cabling infrastructure
- b. Six (6) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) for systems involving new underground cabling infrastructure
- c. Three (3) years of experience developing detailed cost estimates for installation projects involving new above-ground and below-ground Outside Plant cabling infrastructure
- d. Three (3) years of experience developing shore Installation Design Plans involving new above-ground outdoor cabling infrastructure
- e. Six (6) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) for systems involving Outside Plant (OSP) cabling infrastructure

**Knowledge:** Shore Outside Plant Cabling Infrastructure Installation Project Engineers shall meet the knowledge requirements for Level 3 Shore Outside Plant Cabling Infrastructure Installation Project Engineers.

**Skills and Abilities:** To be qualified as a Shore Outside Plant Cabling Infrastructure Installation installation Project Engineer at this level, personnel must possess the skills and abilities required at level 3 for this position and must be able to supervise and train others to meet Level 3 requirements for this position.

**3e. Shore Installation Quality Assurance Engineer**

**Education:** Personnel qualifying for this position shall have a bachelor's of science degree in physics, computer science, naval architecture, or in electrical/electronics, structural, mechanical, naval, telecommunications or civil engineering. In addition, personnel qualifying for this position shall have at least one of the following credentials:

- a. Licensed Professional Electrical Engineer in one of the fifty states or US territories
- b. Registered Communications Distribution Designer (RCDD) credential from Building Industry Consulting Service International (BICSI)
- c. Cisco Certified Network Associate (CCNA)

**Experience:** Personnel qualifying for this position shall have at least:

- a. Six (6) years experience as developing shore Installation Design Plans for ISP work in accordance with the SPAWAR Shore Installation Process Handbook
- b. Six (6) years of experience preparing, conducting, and performing Site-Specific SOVTs.
- c. Four (4) years of experience as a project lead on installations costing over \$100,000.
- d. Three (3) years of experience working on designs for projects requiring outdoor antenna installations
- e. Three (3) years of experience working on projects requiring the installation of underground cable plant.

**Design Requirements Knowledge:** Personnel qualifying for this position shall have the technical knowledge to be expected of a person with the aforementioned background and experience including:

- a. A working knowledge of AutoCAD and Microsoft Project
- b. A knowledge of the contents of the shore installation standards listed in the contract SOW
- c. In-depth knowledge of the design and drawing standards contained in Appendix Q and Appendix AC of the Shore Installation Process Handbook.
- d. In-depth knowledge of the SPAWAR Installation Requirements Drawing standard.

**Test and Measuring Equipment Knowledge:** Personnel qualifying for this position shall know the requirements of the SPAWAR System Operational Verification Test (SOVT)

Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations. In addition, personnel qualifying for this position shall understand the proper application, operation, and use of the following test and measuring equipment.

- a. Bit-error rate test sets
- b. Optical Time Domain Reflectometers (OTDR)
- c. AC power analyzers
- d. Multimeters or separate voltmeter, ammeter, and resistance meters
- e. Clamp-on ammeters
- f. VSWR meters
- g. Fall of Potential Ground Testers
- h. Storage oscilloscopes
- i. Optical Loss Test Sets (OLTSSs)
- j. LAN Cable Certification Test Sets (e.g., Cat 6 Cable Certification Test Set)
- k. Theodolites to create horizon masks
- l. GPS locators to prepare coverage area maps for shore line-of-site antennas.
- m. Voltage Standing Wave Ratio (VSWR) test sets
- n. Radio Frequency (RF) Field Strength Meters
- o. Spectrum analyzers
- p. GPS location and direction finding systems
- q. Mandrel Test Sets for underground conduit testing
- r. Network Analyzers for Ethernet networks

**Quality Assurance Knowledge:** Personnel qualifying for this position shall be thoroughly familiar with the contents of ISO 9001:2008 and the contractor's Quality Assurance documentation relevant to the contract, such as Quality Assurance or Inspection checklists. The personnel shall understand the principles behind the application statistical sampling to inspections and audits. The personnel shall be familiar with the Quality Assurance principles and theories expressed by widely recognized pioneers in the field (e.g., Juran and Deming).

**Skills and Abilities:** Holders of this position shall be able to:

- a. Keep track of the quality status of a defined set of ongoing tasks being performed
- b. Clearly determine and communicate detailed status information for all ongoing installation projects under his or her cognizance.
- c. Maintain an awareness of the quality of the work being performed, inform the Program Manager and Deputy Program Manager of problems quickly when discovered, and recommend to the Program Manager whatever corrective action is needed to prevent the problem or reduce its probability of recurrence.
- d. Interpret and review engineering drawings, test plans, and technical specifications and discover errors that should be apparent to one qualified to fill the position, provide clear text descriptions of the errors found, and clear recommendations for corrective action.
- e. Monitor ongoing installation activities and provide clear text descriptions of the errors and standards violations found with clear recommendations for corrective action.
- f. Ensure that secure and meticulous records are kept of all inspections and tests conducted for installations under his or her cognizance.
- g. Develop detailed inspection and test procedures and forms tailored to C4ISR installation work.

#### 4. Engineer/Scientist 3

##### 4a. Shipboard Installation Quality Assurance Engineer

**Education:** BS degree in Physics, Computer Science, Naval Architecture or Engineering in one of the following disciplines: Electrical/Electronics, Structural, Mechanical, Industrial, Naval, or Telecommunications. Must be one of the following: Licensed Professional Electrical or Electronics Engineer in one of the fifty states or US territories, Registered Communications Distribution Designer (RCDD) (from Building Industry Consulting Service International (BICSI)), Cisco Certified Network Associate (CCNA), a Certified Quality Engineer - CQE with certification from the American Society for Quality.

**Experience:** Six (6) years of experience with C4ISR shipboard system installation efforts to include: Requirements Development and Analysis (e.g., Ship or Submarine Installation

Drawing development, As-built Drawing development, System Operational Verification Test (SOVTs) Plan development, Ship Check Report completion and analysis, Systems Architecture Development, and Logistics Support requirements review/analysis.) Three (3) years of experience preparing for, conducting, and performing shipboard SOVTs. Two (2) years of experience working on designs for projects requiring ship or submarine antenna installations.

**Knowledge: In-depth** knowledge of each of the following is required:

- a. NAVSEA afloat installation design requirements
- b. Requirements included in the SPAWAR System Operational Verification Test (SOVT) Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations
- c. Design and drawing standards contained in the SPAWAR Installation Requirements Drawing (IRD) Standard.

#### **4b. Shipboard Systems Engineer**

**Education:** BS degree in Physics, Computer Science, Naval Architecture or Engineering in one of the following disciplines: Electrical/Electronics, Structural, Mechanical, Industrial, Naval, Telecommunications or Civil.

**Experience:** Six (6) years of experience in C4ISR shipboard systems, to include: Systems Analysis, Systems Architecture, Systems/Equipment Support, Test and Evaluation, and Logistics support of C4ISR requirements. Specific experience: design, integration, and installation of shipboard military systems involving communications systems, navigation systems, direction finding systems, electronic warfare systems, and other shipboard electronic systems. Two (2) years experience providing high-level analysis and consultation in solving complex installation design problems relating to shipboard communications electronics systems; administration, management, and supervision for the successful implementation of electronics systems design, and installation on U.S. Navy ships, submarines and shore facilities; analytical studies and detailed planning for installation of C4I systems on U.S. Navy ships. Note:

#### **4c. Shore Antenna Installation Project Engineer, Level 3**

Those qualifying for this position must possess the qualifications for a Level 2 Inside Plant (ISP) Project Engineer and the following **additional** requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. One (1) year of experience developing detailed cost estimates for installations involving three (3) different physical kinds (e.g., parabolic dish, Yagi, dipole, whip, microstrip patch, etc.) of antennas
- b. Three (3) years experience developing shore Installation Design Plans and managing projects involving antenna installations
- c. Three (3) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) on antenna systems

**Knowledge:** Antenna Installation Project Engineers shall have an in-depth knowledge of:

- a. Antenna related grounding and lightning protection requirements contained in MIL-HDBK-419A, MIL-STD-188-124B Notice 3, and NFPA 780
- b. Frequency approval requirements, including the roles of the Frequency Management Office, Military Communications Electronics Board, and the National Telecommunications and Information Administration (NTIA)
- c. NAVFAC site approval requirements
- d. FAA and FCC antenna tower lighting requirements
- e. OSHA requirements for ladders and platforms
- f. Antenna and antenna tower foundation and platform requirements
- g. Structural Standards for Steel Antenna Towers and Antenna Supporting Structures (TIA-222-G or most recent revision) if a new antenna structure is being designed
- i. Procedures and requirements for coordinating the work through the local SPAWAR Facilities Engineering Personnel and NAVFAC personnel. These procedures will vary depending upon the location of the installation. The types of work that should be coordinated in this way include:
  - 1) Conducting building structural analyses for potential antenna platform sites on roofs

- 2) Conducting soil analyses for potential antenna platform sites on open land.
  - j. Microwave path analysis (for project engineers working on microwave antenna installations only).
  - k. Safety requirements in the National Electrical Safety Code (NESC), the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1 dtd 3 Nov 03) (governs safety on construction sites), and in the Navy Safety and Occupational Health Program Manual, OPNAVINST 5100.23G (dated 30 Dec 05).
  - l. Antenna cable and waveguide building penetration requirements of the National Electrical Code and MIL-STD-188-124B
- Skills and Abilities:** To be qualified as an antenna installation Project Engineer at this level, personnel must be able to properly complete the following tasks:
- a. Use a theodolite to create a horizon mask.
  - b. Use Microsoft Excel or similar software to prepare a microwave path analysis with charts and path cross-sections for different conditions.
  - c. Use GPS locators and contour maps to prepare coverage area maps for shore line-of-site antennas.
  - d. Use a VSWR test set to obtain standing wave ratio readings.
  - e. Use a RF Field Strength Meter to create field strength maps.
  - f. Use a spectrum analyzer to map the spectrum received and transmitted by a system being installed.

**4d. Shore Outside Plant Cabling Infrastructure Installation Project Engineer, Level 3**

Those qualifying for this position must possess the qualifications for a Level 2 Inside Plant (ISP) Project Engineer and the following **additional** requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. Three (3) years experience as developing shore Installation Design Plans involving underground cabling infrastructure
- b. Three (3) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) for systems involving new underground cabling infrastructure
- c. One (1) year of experience developing detailed cost estimates for installation projects involving new above-ground ground cabling infrastructure
- d. One (1) year of experience developing shore Installation Design Plans involving above-ground outdoor cabling infrastructure
- e. Three (3) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) for systems involving Outside Plant (OSP) cabling infrastructure

**Knowledge:** Project Engineers responsible for OSP cable installations shall have a thorough knowledge of:

- a. Outside plant related grounding requirements and approved methods (MIL-HDBK-419A, MIL-STD-188-124B Notice 3 and the National Electrical Safety Code.)
- b. Protector block installation and grounding requirements of the National Electrical Code and J-STD-607-A
- c. Industry standards governing outside plant cable installations including:
  - 1) TIA-758-A, "Customer-owned Outside Plant Telecommunications Infrastructure"
  - 2) BiCSi Customer-Owned Outside Plant Design Manual (3rd Edition is latest at the time of this revision)
  - 3) TIA-590-A, "Standard for Physical Location and Protection of Below-Ground Fiber Optic Cable Plant", dated January 1997
  - 4) National Electrical Manufacturer's Association Bulletin No. TCB 2-2000, "NEMA Guidelines for the Selection and Installation of Underground Nonmetallic Duct"
- d. Government standards governing outside plant cable installations including:
  - 1) Unified Facilities Guide Specifications, UFGS-33 71 02.00 20, "Underground Electrical Distribution"
  - 2) Unified Facilities Guide Specifications, Section 33 82 00, "Telecommunications Outside Plant (OSP)"

- 3) USDA RUS Bulletin 1751F-644, "Underground Plant Construction"
- 4) USDA RUS Bulletin 1753F-201 (PC-4), "RUS Standard for Acceptance Tests and Measurements"
- e. Safety requirements of the latest versions of:
  - 1) National Electrical Safety Code (especially physical clearance and grounding requirements)
  - 2) U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1) (governs safety on construction sites)
  - 3) Navy Safety and Occupational Health Program Manual, OPNAVINST 5100.23Series (especially the Chapter on Confined Space Entry)
  - 4) OSHA (Standards -29 CFR), Part 1926, Subpart P (Excavations)
  - 5) OSHA (Standards -29 CFR), Part 1910, Subpart R (Telecommunications)
- f. Specific labeling requirements and techniques for OSP cable. This is actually covered by standards listed above, but is specifically called out to emphasize its importance. For example, the PE must have the knowledge needed to ensure that:
  - 1) Labels resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and that they have a design life equal to or greater than the labeled component. (Required by TIA/EIA-606-A Section 10.1.1)
  - 2) Cables are permanently identified by tags or otherwise at each manhole or other access opening of the conduit system. (Required by NESC Rule 341.b.3.a.(1) and TIA-606-A)
  - 3) Two fiber connection positions (or polarities) are labeled using the letters "A" and "B". (Required by TIA-758-A Section 5.3.5).

**Skills and Abilities:** To be qualified as an Outside Plant Cabling Infrastructure Installation Project Engineer, personnel must be able to properly use the proper tools and equipment to complete the following tasks:

- a. OTDR testing on single-mode and multimode fiber optic cable
- b. Optical Loss testing on single-mode and multimode fiber optic cable
- c. Bit error rate testing on circuits (T1, DSL, etc.) over copper cable
- d. Audio frequency signal loss testing and signal quality testing
- e. Gas detector testing for confined space entry
- f. Distance measurements
- g. Microscopic examination of fiber optic cable terminations
- h. Mandrel testing of conduits

#### **4e. Shore Inside Plant (ISP) Installation Engineer, Level 3**

**Education or Technical Background:** Personnel qualifying for this position shall meet at least one of the following four technical background requirements.

- a. A bachelor's of science degree in physics, electrical engineering, structural engineering, civil engineering, telecommunications engineering, or computer science).
- b. Five years of experience working as a qualified enlisted U.S. military serviceman with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) man with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating).
- c. An associate's degree or equivalent in electronics or computer science and four years of experience performing electrical and electronic installation work for the US Department of Defense, a telephone equipment company, or a communications equipment provider (e.g., Nortel Networks, Lucent, Alcatel, AT&T) as a qualified technician or installer.
- d. Be registered as a BiCSi Registered Communications Distribution Designer (RCDD) with six years of installation work experience as a technician, installer, or designer. (Five years is the minimum amount of experience required to become registered.) At least one year of this experience shall have been in installing US Navy systems.

**Experience:** Personnel qualifying for this position shall have at least:

- a. Six (6) years experience as developing shore Installation Design Plans (IDPs) for ISP work in accordance with the SPAWAR Shore Installation Process Handbook including at

least two (2) years of experience preparing IDPs for installing equipment to be used to process classified information.

b. Six (6) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) in accordance with the SPAWAR Shore Installation Process Handbook or the SPAWAR SOVT Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations

c. Three (3) years of experience developing detailed cost estimates for installation projects involving new inside plant cabling infrastructure and new equipment installations

**Knowledge:** Shore project engineers are required to maintain and demonstrate knowledge of the following installation design requirements:

a. Shore Installation Process Handbook (SIPH) process and deliverable requirements

b. Commercial and military standards that govern inside plant (ISP) communications equipment, cabling, and electrical wiring installations. Shore Installation Process Handbook Appendix AC discusses all of the major shore installation guidance documents pertaining to SPAWAR shore installations. All shore project engineers are required to be thoroughly familiar with the entire contents of Appendix AC, including its attachments, and shall be capable of conducting further research the standards discussed as required for the installation projects that they are assigned to.

c. Safety requirements specified in the Contract.

d. Installation design and drawing standards as defined by Appendix Q of the Shore Installation Process Handbook.

e. The principles behind electrical power circuit design and electrical safety.

f. The principles behind the design of Internet Protocol (IP) networks.

**Skills and Abilities:** Shore project engineers are required to be able to accurately estimate the type, quantity, and cost of resources required to implement shore installation designs.

Shore project engineers are also required to be able to accurately estimate the time required to complete both installation designs and installation implementations. Shore Inside Plant (ISP) Installation Engineers shall know how to properly operate any of the following equipment used by the installing activity:

a. Bit-error rate test sets

b. Optical Time Domain Reflectometers (OTDRs)

c. AC power analyzers (one phase required, 3-phase preferred).

d. Multimeters or separate voltmeter, ammeter, and resistance meters

e. Clamp-on ammeters

f. VSWR meters

g. Fall of Potential Ground Testers

h. Storage oscilloscopes

i. Optical Loss Test Sets

j. LAN Cable Certification Test Sets (e.g., Cat 6 Cable Certification Test Set)

k. Network Analyzers for Ethernet networks

l. Humidity meters

#### 4f. Software Engineer, Level 3

**Education:** BS degree in Electrical/Electronics Engineering, Software Engineering, Computer Engineering, or Computer Science. Working towards obtaining one of the following certifications within one and a half years after assuming duties: Certified Software Development Professional (CSDP) (Previously known as Certified Software Engineering Professional (CSEP)), or – with COR approval – a vendor/platform specific certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), Oracle Certified Professional (OCP), etc.).

**Experience:** Six (6) years of software development experience to include developing, modifying, or maintaining software. Experience shall include software design and implementation, software debugging, software documentation development, developing installation instructions for software.

**4g. Internet Protocol (IP) Network Systems Design Engineer, Level 3**

**Education:** A person qualifying for this position shall currently possess one of the following:

- a. Cisco Certified Network Professional (CCNP) certification
- b. Cisco CCNA certification, a Microsoft MCSE credential and six (6) years of the experience described below for this position
- c. A Bachelor of Science (BS) degree in Computer Science, Management Information Systems, Engineering, or Mathematics

**Experience:** Personnel qualifying for this position shall have at least four (4) years of experience designing, installing, configuring and troubleshooting local and wide area Internet Protocol (IP) networks with 100 or more users. Experience must include configuration of at least half of the following and all of the following with an asterisk:

- a. Cisco routers\*
- b. IP switches\*
- c. Virtual Private Network Devices
- d. Firewalls\*
- e. Windows Servers
- f. Unix/Linux Servers
- g. E-mail servers
- h. Domain name servers
- i. Intrusion detection/prevention devices
- j. Network management devices
- k. Network storage devices (includes SAN switches)
- l. Packet shapers.

**Skills and Abilities:** Personnel qualifying for this position shall be able to demonstrate excellent skills in the following areas:

- a. Developing performance testing procedures for IP network throughput performance and network security
- b. Providing full network configuration documentation that will enable Navy civilian and military Information Technology professionals to reconstitute any portion of the Network after any group of hardware failures

**4h. Civil Engineer**

**Education and Credentials:** Personnel qualifying for this position shall be a licensed professional civil engineer and shall have a bachelor's of science degree in civil engineering. When working on installation designs for a specific United States location, the license shall be recognized by the state, territory, or commonwealth of the United States of America where the installation will take place.

**Experience:** Personnel qualifying for this position shall have the experience required to obtain the license. In addition, two years of experience in working on designs for projects requiring trenching and the restoration of roadway surfaces is required.

**4i. Structural Engineer**

**Education:** BS degree in Structural or Civil Engineering. Professional Engineering (PE) license in Structural Engineering.

**Experience:** Personnel qualifying for this position shall have the experience required become a licensed professional structural engineer. In addition, two years of experience in designing antenna support structures and in developing seismic activity resistant designs is required. When working on installation designs for a specific United States location, the license shall be recognized by the state, territory, or commonwealth of the United States of America where the installation will take place.

**4j. Naval Architect**

**Education:** BS degree in Naval Architecture.

**Experience:** Six (6) years of experience in marine structural mechanics, to include: Systems Analysis, Systems Architecture, Systems/Equipment Support, Test and Evaluation, and

Logistics support. Specific experience: Two (2) years of experience in the design of ship structures and hulls; drawing development for ship conversions, modernization, repairs, or new construction; developing U.S. Navy ship designs, performing design reviews, and conducting structural analyses; determination of structural loading caused by wind, waves, ship's motion, shock (including explosions), vibrations and machinery; performing weight and moment studies on various classes of ships and stability conditions.

## 5. Engineer/Scientist 2

### 5a. **Shore Antenna Installation Project Engineer, Level 2**

Those qualifying for this position must possess the qualifications for a Level 1 Inside Plant (ISP) Project Engineer and the following additional requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. One (1) year experience developing shore Installation Design Plans and managing projects involving antenna installations
- b. One (1) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) on antenna systems

**Knowledge:** Antenna installation Project Engineers shall be familiar with the existence of and be able to find guidance related to:

- a. Antenna related grounding and lightning protection requirements contained in MIL-HDBK-419A, MIL-STD-188-124B Notice 3, and NFPA 780
- b. Frequency approval requirements, including the roles of the Frequency Management Office, Military Communications Electronics Board, and the National Telecommunications and Information Administration (NTIA)
- c. NAVFAC site approval requirements
- d. FAA and FCC antenna tower lighting requirements
- e. OSHA requirements for ladders and platforms
- f. Antenna and antenna tower foundation and platform requirements
- g. Structural Standards for Steel Antenna Towers and Antenna Supporting Structures (TIA-222-G or most recent revision) if a new antenna structure is being designed
- i. Local procedures and requirements for coordinating the work through the local SPAWAR Facilities Engineering Personnel and NAVFAC personnel. These procedures will vary depending upon the location of the installation. The types of work that should be coordinated in this way include:
  - 1) Conducting building structural analyses for potential antenna platform sites on roofs
  - 2) Conducting soil analyses for potential antenna platform sites on open land
- j. Microwave path analysis (for project engineers working on microwave antenna installations only).
- k. Safety requirements in the National Electrical Safety Code (NESC), the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1 dtd 3 Nov 03) (governs safety on construction sites), and in the Navy Safety and Occupational Health Program Manual, OPNAVINST 5100.23G (dated 30 Dec 2005)
- l. Antenna cable /waveguide building penetration requirements of the National Electrical Code and MIL-STD-188-124B

**Skills and Abilities:** To be qualified as an antenna installation Project Engineer at this level, personnel must be able to complete at least half of the following tasks using the appropriate tools and test equipment:

- a. Use a theodolite to create a horizon mask.
- b. Use Microsoft Excel or similar software to prepare a microwave path analysis with charts and path cross-sections for different conditions.
- c. Use GPS locators and contour maps to prepare coverage area maps for shore line-of-site antennas.
- d. Use a VSWR test set to obtain standing wave ratio readings.
- e. Use a RF Field Strength Meter to create field strength maps.
- f. Use a spectrum analyzer to map the spectrum received and transmitted by the system being installed.

**5b. Shore Outside Plant (OSP) Cabling Infrastructure Installation Project Engineer, Level 2**

Those qualifying for this position must possess the qualifications for a Level 1 Inside Plant (ISP) Project Engineer and the following **additional** requirements:

**Experience:** Personnel qualifying for this position shall have at least:

- a. One (1) year of experience developing shore Installation Design Plans for underground or above-ground OSP cabling infrastructure
- b. One (1) year of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) for systems involving new OSP cabling infrastructure

**Knowledge:** Project Engineers responsible for OSP cable installations shall be familiar with the existence of and be able to find guidance related to:

- a. Outside plant related grounding requirements and approved methods (MIL-HDBK-419A, MIL-STD-188-124B Notice 3 and the National Electrical Safety Code.)
- b. Protector block installation and grounding requirements of the National Electrical Code and J-STD-607-A
- c. Industry standards governing outside plant cable installations including:
  - 1) TIA-758-A, Customer-owned Outside Plant Telecommunications Infrastructure and the BiCSi Customer-Owned Outside Plant Design Manual (3rd Edition is latest at the time of this revision)
  - 2) TIA-590-A, "Standard for Physical Location and Protection of Below-Ground Fiber Optic Cable Plant, dated January 1997
  - 3) National Electrical Manufacturer's Association Bulletin No. TCB 2-2000, "NEMA Guidelines for the Selection and Installation of Underground Nonmetallic Duct"
- d. Government standards governing outside plant cable installations including:
  - 1) Unified Facilities Guide Specifications, UFGS-33 71 02.00 20, Underground Electrical Distribution
  - 2) Unified Facilities Guide Specifications, Section 33 82 00, Telecommunications Outside Plant (OSP)
  - 3) USDA RUS Bulletin 1751F-644, Underground Plant Construction
  - 4) USDA RUS Bulletin 1753F-201 (PC-4), RUS Standard for Acceptance Tests and Measurements
- e. Safety requirements of the latest versions of:
  - 1) National Electrical Safety Code (especially physical clearance and grounding requirements)
  - 2) U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1) (governs safety on construction sites)
  - 3) Navy Safety and Occupational Health Program Manual, OPNAVINST 5100.23Series (especially the Chapter on Confined Space Entry)
  - 4) OSHA (Standards -29 CFR), Part 1926, Subpart P (Excavations)
  - 5) OSHA (Standards -29 CFR), Part 1910, Subpart R (Telecommunications)
- f. Specific labeling requirements and techniques for OSP cable. This is actually covered by standards listed above, but is specifically called out to emphasize its importance. For example, the PE must have the knowledge needed to ensure that:
  - 1) Labels resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and that they have a design life equal to or greater than the labeled component. (Required by TIA/EIA-606-A Section 10.1.1)
  - 2) Cables are permanently identified by tags or otherwise at each manhole or other access opening of the conduit system. (Required by NESC Rule 341.b.3.a.(1) and TIA-606-A)
  - 3) Two fiber connection positions (or polarities) are labeled using the letters "A" and "B". (Required by TIA-758-A Section 5.3.5).

**Skills and Abilities:** To be qualified as an Outside Plant Cabling Infrastructure Installation Project Engineer at this level, personnel must be able to use the proper tools and equipment to complete at least one-half of the following tasks:

- a. OTDR testing on single-mode and multimode fiber optic cable

- b. Optical Loss testing on single-mode and multimode fiber optic cable
- c. Bit error rate testing on circuits (T1, DSL, etc.) over copper cable
- d. Audio frequency signal loss testing and signal quality testing
- e. Gas detector testing for confined space entry
- f. Distance measurements
- g. Microscopic examination of fiber optic cable terminations
- h. Mandrel testing of conduits

**5c. Shore Inside Plant (ISP) Installation Engineer, Level 2**

**Education or Technical Background:** Personnel qualifying for this position shall meet at least one of the following four technical background requirements.

- a. A bachelor's of science degree in physics, electrical engineering, structural engineering, civil engineering, telecommunications engineering, or computer science).
- b. Four (4) years of experience working as a qualified enlisted U.S. military serviceman with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) man with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating).
- c. An associate's degree in electrical or electronics engineering or computer science and two (2) years of experience performing electrical and electronic installation work for the US Department of Defense, a telephone equipment company, or a communications equipment provider (e.g., Nortel Networks, Lucent, Alcatel, AT&T) as a qualified technician or installer.
- d. Be registered as a BiCSi Registered Communications Distribution Designer (RCDD) with six years of installation work experience as a technician, installer, or designer. (Five years is minimum required to become registered.)

**Experience:** Personnel qualifying for this position shall have at least:

- a. Three (3) years experience as developing shore Installation Design Plans (IDPs) for ISP work in accordance with the SPAWAR Shore Installation Process Handbook including at least two (1) year of experience preparing IDPs for installing equipment to be used to process classified information.
- b. Three (3) years of experience preparing, conducting, and performing Site-Specific System Operational Verification Tests (SOVTs) in accordance with the SPAWAR Shore Installation Process Handbook or the SPAWAR SOVT Preparation and Execution Guide (SPEG) for Ship, Shore, and Submarine Installations
- c. One (1) year of experience developing detailed cost estimates for installation projects involving new inside plant cabling infrastructure and new equipment installations

**Knowledge:** Shore project engineers are required to maintain and demonstrate knowledge of the following installation design requirements:

- a. Shore Installation Process Handbook (SIPH) process and deliverable requirements
- b. Commercial and military standards that govern inside plant (ISP) communications equipment, cabling, and electrical wiring installations. Shore Installation Process Handbook Appendix AC discusses all of the major shore installation guidance documents pertaining to SPAWAR shore installations. All shore project engineers are required to be thoroughly familiar with the entire contents of Appendix AC, including its attachments, and shall be capable of conducting further research the standards discussed as required for the installation projects that they are assigned to.
- c. Safety requirements specified in the contract.
- d. Installation design and drawing standards as defined by Appendix Q of the Shore Installation Process Handbook.
- e. The principles behind electrical power circuit design and electrical safety.
- f. The principles behind the design of Internet Protocol (IP) networks.

**Skills and Abilities:** Shore project engineers are required to be able to accurately estimate the type, quantity, and cost of resources required to implement shore installation designs. Shore project engineers are also required to be able to accurately estimate the time required to complete both installation designs and installation implementations. Shore Inside Plant (ISP) Installation Engineers at this level shall know how to properly operate at least half of the following equipment that is used by the installing activity:

- a. Bit-error rate test sets
- b. Optical Time Domain Reflectometers (OTDRs)
- c. AC power analyzers (one phase required, 3-phase preferred).
- d. Multimeters or separate voltmeter, ammeter, and resistance meters
- e. Clamp-on ammeters
- f. VSWR meters
- g. Fall of Potential Ground Testers
- h. Storage oscilloscopes
- i. Optical Loss Test Sets
- j. LAN Cable Certification Test Sets (e.g., Cat 6 Cable Certification Test Set)
- k. Network Analyzers for Ethernet networks
- l. Humidity meters

**5d. Software Engineer, Level 2**

**Education:** BS degree in Electrical/Electronics Engineering, Software Engineering, Computer Engineering, Computer Science. Working towards obtaining one of the following certifications within one and a half years after assuming duties: Certified Software Development Professional (CSDP) (Previously known as Certified Software Engineering Professional (CSEP)), or – with COR approval – a vendor/platform specific certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), Oracle Certified Professional (OCP), etc.).

**Experience:** Three (3) years of software development experience to include developing, modifying, or maintaining software. Experience shall include software design and implementation, software debugging, software documentation development, developing installation instructions for software.

**5e. Internet Protocol (IP) Network Systems Design Engineer, Level 2**

**Education:** A person qualifying for this position shall currently possess one of the following:

- a. Cisco CCNA certificate and a Microsoft MCSE credential
- b. A bachelor's of science degree in Computer Science, Management Information Systems, Engineering, or Mathematics and either a Cisco CCNA certification and a Microsoft MCSE credential

**Experience:** Personnel qualifying for this position shall have at least two (2) years of experience designing, installing, configuring and troubleshooting local and wide area Internet Protocol (IP) networks with 20 or more users. Experience must include configuration of at least four of the following and two of the following with an asterisk:

- a. Cisco routers\*
- b. IP switches\*
- c. Virtual Private Network Devices
- d. Firewalls\*
- e. Windows Servers
- f. Unix/Linux Servers
- g. E-mail servers
- h. Domain name servers
- i. Intrusion detection/prevention devices
- j. Network management devices
- k. Network storage devices (includes SAN switches)
- l. Packet shapers.

**Skills and Abilities:** Personnel qualifying for this position shall be able to demonstrate adequate skills in configuring Cisco routers and developing network architecture diagrams.

**6. Engineer/Scientist 1**

**6a. Software Engineer, Level 1 (Apprentice)**

**Education:** BS degree in Electrical/Electronics Engineering, Software Engineering, Computer Engineering, Computer Science. Working towards obtaining one of the following certifications within one and a half years after assuming duties: Certified Software Development Professional (CSDP) (Previously known as Certified Software Engineering Professional (CSEP)), or – with COR approval – a vendor/platform specific certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), Oracle Certified Professional (OCP), etc.).

**Experience:** One (1) year of classroom or work experience in writing source code, and fully documenting the code developed.

**6b. Shore Inside Plant (ISP) Installation Engineer, Level 1 (Apprentice)**

**Education or Technical Background:** Personnel qualifying for this position shall meet at least one of the following four technical background requirements.

- a. A bachelor's of science degree in physics, electrical engineering, structural engineering, civil engineering, telecommunications engineering, or computer science).
- b. Four (4) years of experience working as a qualified enlisted U.S. military serviceman with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) man with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating).
- c. An associate's degree in electrical or electronics engineering or computer science.
- d. Be registered as a BiCSi Registered Communications Distribution Designer (RCDD) with six years of installation work experience as a technician, installer, or designer. (Five years is minimum required to become registered.)

**Experience:** Experience is not required in this position except as needed to meet the previously stated Education or Technical Background requirements.

**Knowledge:** Apprentice Shore project engineers are required to maintain and demonstrate knowledge of the following:

- a. Safety requirements specified in the Contract and the principles behind electrical power circuit design and electrical safety.
- b. Installation design and drawing standards as defined by Appendix Q of the Shore Installation Process Handbook.

**Skills and Abilities:** Shore project engineers are required to be able to learn to properly operate any of the following equipment that is used by the installing activity:

- a. Bit-error rate test sets
- b. Optical Time Domain Reflectometers (OTDRs)
- c. AC power analyzers (one phase required, 3-phase preferred).
- d. Multimeters or separate voltmeter, ammeter, and resistance meters
- e. Clamp-on ammeters
- f. VSWR meters
- g. Fall of Potential Ground Testers
- h. Storage oscilloscopes
- i. Optical Loss Test Sets
- j. LAN Cable Certification Test Sets (e.g., Cat 6 Cable Certification Test Set)
- k. Network Analyzers for Ethernet networks
- l. Humidity meters

**6c. Internet Protocol (IP) Network Systems Design Engineer, Level 1 (Apprentice)**

**Education:** A person qualifying for this position shall currently possess:

- a. Cisco CCNA certificate or a Microsoft MCSE credential
- b. A bachelor's of science degree in Computer Science, Management Information Systems, Engineering, or Mathematics

**Experience:** None.

**7. Logistician 3**

**Education:** Bachelor's degree. Professional Logistics Certification – i.e., Defense Acquisition Workforce Improvement Act (DAWIA) certified in Lifecycle [Acquisition] Logistics Level 1, OR have equivalent logistics training (resume to specify all equivalent training), OR possess an additional two (2) years working in direct support of defense life-cycle logistics.

**Experience:** Six (6) years of experience in defense life-cycle (acquisition) logistics support (or 8 years if not DAWIA Level 1 certified) of electronic systems, to include: logistics management, principles, practices, and processes. Four (4) years support of C4ISR systems. Demonstrated skills, to include: Analyzing Engineering/Systems Management Data, Developing Logistics Plans and Procedures, and Developing Logistics Management Plans and Guidelines. Specific experience: Development of Operational Logistic Support Summaries and Operational Logistic Support Plans for C4ISR systems, Updating Logistic Support Documentation including CDMD-OA database information.

#### **8. Management Analyst 3**

**Education:** Bachelor's degree in Physical Science, Engineering, Management Information Systems or Business.

**Experience:** Six (6) years of Contract Management experience, to include: Development of Program Acquisition Documentation, Development of Testing Criteria, Development of Corrective Action Systems, Development of Program Monitoring Approach (e.g. PERT, CPM, EVM), Analysis of Programs Health, Data Collection and Analysis, Development of Cost Estimates, and Development of Program Status Reports related to USN shore or shipboard installations.

**Knowledge:** Comprehensive knowledge of Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

#### **9. Management Analyst 2**

**Education:** Bachelor's degree in Physical Science, Engineering, Management Information Systems or Business.

**Experience:** Two (2) years of Contract Management experience, to include: Development of Program Acquisition Documentation, Data Collection and Analysis, Development of Cost Estimates, and Development of Program Status Reports related to USN shore or shipboard installations.

**Knowledge:** Knowledge of Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

#### **10. Management Analyst 1**

**Education:** Bachelor's degree in Physical Science, Engineering, Management Information Systems or Business.

**Experience:** One (1) year of Contract Management experience, to include: Development of Program Acquisition Documentation, Data Collection and Analysis related to USN shore or shipboard projects.

**Knowledge:** Familiarity with Federal Acquisition Regulation (FAR) and DoD procurement policies and procedures.

#### **11. Technical Writer/Editor 4**

**Education:** BA degree in English, Journalism, or Technical Writing.

**Experience:** Fifteen (15) years of experience in the military electronic systems, to include: writing/editing technical documentation, procedures and guidelines for C4ISR systems or equipment. Specific experience: writing test plans, procedures, and reports. Five (5) years developing, preparing, reviewing and editing technical documents relating to the installation, testing, and logistic support of C4ISR systems.

**Knowledge:** Knowledge of SECNAVINST 5216.5D (Naval Writing Standards).

#### **12. Technical Writer/Editor 3**

**Education:** BA degree in English, Journalism, or Technical Writing.

**Experience:** Ten (10) years of experience in the military electronic systems, to include: writing/editing technical documentation, procedures and guidelines for C4ISR systems or equipment. Specific experience: writing test plans, procedures, and reports. Three (3) years developing, preparing, reviewing and editing technical documents relating to the installation, testing, and logistic support of C4ISR systems.

**Knowledge:** Knowledge of SECNAVINST 5216.5D (Naval Writing Standards).

### **13. Management and Program Technician 3**

**Education:** High School diploma or GED.

**Experience:** Ten (10) years of direct work experience with the use of advanced information technology to develop and/or integrate complex data, to include: requirements analysis; project management procedures including out year budgeting for programs involving OMN, FMS, OPN, SCN, and RDT&E monies; development of contract schedules, out year planning and POM budgets, compliance planning and program planning.

**Knowledge:** Must have knowledge of DoD standards and regulations like the FAR, DFAR, OPM requirements, and other business related regulations.

### **14. Management and Program Technician 2**

**Education:** High School diploma or GED.

**Experience:** Six (6) years of direct work experience with the use of advanced information technology to develop and/or integrate complex data, to include: requirements analysis; project management procedures including out year budgeting for programs involving OMN, FMS, OPN, SCN, and RDT&E monies; development of contract schedules, out year planning and POM budgets, compliance planning and program planning.

**Knowledge:** Must have knowledge of DoD standards and regulations like the FAR, DFAR, OPM requirements, and other business related regulations.

### **15. Management and Program Technician 1**

**Education:** High School diploma or GED.

**Experience:** Three (3) years of direct work experience with the use of advanced information technology to develop and/or integrate complex data, to include: requirements analysis; project management procedures including out year budgeting for programs involving OMN, FMS, OPN, SCN, and RDT&E monies; development of contract schedules, out year planning and POM budgets, compliance planning and program planning.

**Knowledge:** Must have knowledge of DoD standards and regulations like the FAR, DFAR, OPM requirements, and other business related regulations.

### **16. Computer System Analyst 3**

**Education:** High School diploma or GED. Completed the following certifications within one and a half year after assuming duties: Certified Software Development Professional (CSDP) (Previously known as Certified Software Engineering Professional (CSEP)), or with COR approval complete a vendor/platform specific certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), CISCO Certified Network Professional (CCNP), Oracle Certified Professional (OCP), other).

**Experience:** Five (5) years of USN shore or shipboard Computerized System installation experience, to include: Design, Development, Test and Evaluation

**Knowledge:** Computer System Analysts are required to maintain and demonstrate knowledge of the following, Network Protocols, LAN administration fundamentals, and UNIX and Windows based operating systems.

### **17. Computer System Analyst 2**

**Education:** High School diploma or GED. Completed the following certifications within one and a half year after assuming duties: Certified Software Development Professional (CSDP) (Previously known as Certified Software Engineering Professional (CSEP)), or with COR

approval complete a vendor/platform specific certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), CISCO Certified Network Professional (CCNP), Oracle Certified Professional (OCP), other).

**Experience:** Three (3) years of USN shore or shipboard Computerized System installation experience, to include Test and Evaluation

**Knowledge:** Computer System Analysts are required to maintain and demonstrate knowledge of the following, Network Protocols, LAN administration fundamentals, and UNIX and Windows based operating systems

## **18. Computer System Analyst 1**

**Education:** High School diploma or GED. Working towards completing applicable vendor/platform certification (e.g., Microsoft Certified Solutions Developer (MCSD), Microsoft Certified Applications Developer (MCAD), Microsoft Certified Database Administrator (MCDBA), Sun Certified Professional (SCP), Red Hat Certification Program (RHCP), CISCO Certified Network Professional (CCNP), Oracle Certified Professional (OCP), other).

**Experience:** One (1) year of Computerized System installation experience

**Knowledge:** Computer System Analysts are required to maintain and demonstrate knowledge of the following, Network Protocols, LAN administration fundamentals, and UNIX and Windows based operating systems.

## **19. Engineering Technician 6**

### **19a. Shore Installation Technician (Installer), Expert Lead (Level 6)**

**Education** Personnel qualifying for this position shall have one of the following:

- a. An Associate's Degree or higher in Electrical Engineering, Electronics Technology, or Information Technology
- b. Completion of four (4) years of U.S. military service with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating)
- c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations

**Credentials:** Personnel qualifying for this position shall have the following:

- a. Cardio Pulmonary Resuscitation (CPR) Certification\*
- b. ITS Installer 2 credential (or both ITS Installer 2, Copper and ITS Installer 2, Optical Fiber credentials)
- c. ITS Technician Credential (Requires item b above (Installer 2 Credential))
- d. Valid Electrician's License
- e. Valid Driver's License

**Experience:** Personnel qualifying for this position shall have a total of at least sixteen (16) years of practical experience as an installer of Shore C4ISR equipment for the Department of Defense and/or major telecommunications services or equipment providers (e.g., Nortel Networks, Lucent, Alcatel, AT&T, Time Warner Cable). The experience must include at least ten years of experience installing C4ISR equipment for the Department of Defense and include at least six years of experience working on US Navy Shore C4ISR installations.

**Skills and Abilities:** Personnel qualifying for this position shall have all of the skills and abilities required for a Senior Installation Technician, Shore (Level IV) and shall also be able to:

- a. Effectively lead a crew of other installers in the completion of multiple-site installations
- b. Demonstrate and apply a thorough knowledge of the Appendix AC of the Shore Installation Process Handbook
- c. Effectively brief site personnel on the installation status and on future plans for completing the installation
- d. Understand and correctly red-line as-built drawings.

- e. Locate and correct installation errors such as standards violations and incorrect wiring.

## **20. Engineering Technician 5**

### **20a. Shore Installation Technician (Installer), Lead**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. An Associates Degree or higher in Electrical Engineering, Electronics Technology, or Information Technology
- b. Completion of four (4) years of U.S. military service with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating).
- c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations.

**Credentials:** Personnel qualifying for this position shall have the following:

- a. Cardio Pulmonary Resuscitation (CPR) Certification
- b. ITS Installer 2 Credential (or both ITS Installer 2, Copper and ITS Installer 2, Optical Fiber credentials)
- c. ITS Technician Credential (Requires item b above (Installer 2 Credential))
- d. Valid Driver's License

**Experience:** Personnel qualifying for this position shall have a total of at least twelve (12) years of practical experience as an installer of Shore C4ISR equipment for the Department of Defense and/or major telecommunications services or equipment providers (e.g., Nortel Networks, Lucent, Alcatel, AT&T, Time Warner Cable). The experience must include at least six years of experience installing C4ISR equipment for the Department of Defense and include at least three years of experience working on US Navy Shore C4ISR installations.

**Skills and Abilities:** Personnel qualifying for this position shall have all of the skills and abilities required for a Senior Installation Technician, Shore (Level 4) and shall also be able to:

- a. Effectively lead a crew of other installers in the completion of single site installations
- b. Demonstrate and apply a thorough knowledge of the Appendix AC of the Shore Installation Process Handbook
- c. Effectively brief site personnel on the installation status and on future plans for completing the installation
- d. Understand and correctly red-line as-built drawings.
- e. Locate and correct installation errors like standards violations and incorrect wiring.

## **21. Engineering Technician 4**

### **21a. Senior Shore Installation Engineering Technician, Level 4**

**Technical Background/Education:** Personnel qualifying for this position shall have one of the following:

- a. An Associate's Degree or higher in Electrical Engineering, Electronics Technology, or Information Technology
- b. Completion of four (4) years of U.S. military service with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating)..
- c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations.

**Credentials:** Personnel qualifying for this position shall possess the following credentials:

- a. Cardio Pulmonary Resuscitation (CPR) Certification
- b. ITS Installer 2 (or both ITS Installer 2, Copper and ITS Installer 2, Optical Fiber credentials)

- c. ITS Technician Credential (Requires item b above (Installer 2 Credential))
- d. Valid Driver's License

**Experience:** Personnel qualifying for this position shall have a total of at least ten (10) years of practical experience as an installer of Shore C4ISR equipment for the Department of Defense and/or major telecommunications services or equipment providers (e.g., Nortel Networks, Lucent, Alcatel, AT&T, Time Warner Cable). The experience must include at least six years of experience installing C4ISR equipment for the Department of Defense and include at least three years of experience working on US Navy Shore C4ISR installations.

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall be able to understand and comply with drawings completed in accordance with the SPAWAR Shore Installation Process Handbook. They must be able to climb ladders and work in confined spaces. They shall be highly skilled and experienced in the safe, effective, and efficient use of common installation power and hand tools including hand-held saws, drills (including hammer drills), hole punches, levels, crimpers, fusion splicers, and conduit benders. Personnel shall demonstrate a consistent record of good workmanship and compliance to standards. Personnel shall demonstrate advanced speed and accuracy when performing tasks such as attaching fiber optic connectors, RJ-45 connectors, and DB type connectors. Personnel shall demonstrate above average speed and skill when performing tasks such as dressing cable installations so that the finished product presents a well organized and professional appearance. They shall also be skilled in the operation of all commonly used installation test equipment. This includes spectrum analyzers, voltmeters, VSWR meters, Bit-Error Rate Test Sets, and Category 5e/6 cable testers.

### **21b. Mechanical/Structural Design Technician**

**Technical Background/Education:** Personnel qualifying for this position shall have one of the following:

- a. An Associate's Degree or higher in Mechanical Engineering, Structural Engineering, Mechanical Engineering Technology, or Structural Engineering Technology
- b. Completion of four (4) years of U.S. military service with one of the following technical ratings: Machinist Mate, Structural Mechanic, Machinery Repairman, or Steelworker
- c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed structural design and the fabrication of metal objects.

**Credentials:** Personnel shall be able to demonstrate that they possess the following certifications marked by an asterisk and any of the following certifications required to perform the tasks assigned to them under this contract:

- a. Shipyard Competent Person Certification\*
- b. Cardio Pulmonary Resuscitation (CPR) Certification
- c. Man Aloft Certification (Climber Certification)

**Experience:** Personnel qualifying for this position shall have five (5) years general experience in the mechanical/structural assembly, repair and layout with a minimum of three (3) years experience in mechanical and structural planning including shipboard mechanical and structural requirements related to electronics installations such as antenna supports, equipment foundations, bulkhead and hull penetrations of cables and waveguide. Experience should include designing shipboard air conditioning, venting and cooling systems, conducting and following layout surveys, analyzing test results, preparing/reviewing and modifying schematics, and developing report data/summaries.

**Additional Skills and Abilities:** Personnel qualifying for this position shall be able to climb ladders and work in confined spaces.

## **22. Engineering Technician 3**

### **22a. Shore Installation Engineering Technician, Level 3**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. An Associates Degree or higher in Electrical Engineering, Electronics Technology, or Information Technology

b. Completion of four (4) years of U.S. military service with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating)

c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations

**Credentials:** Personnel qualifying for this position shall have the following:

a. Cardio Pulmonary Resuscitation (CPR) Certification

b. BICSI ITS Installer 1 credential

c. Valid Driver's License

**Experience:** Personnel qualifying for this position shall have a total of at least eight (8) years of practical experience as an installer of Shore C4ISR equipment for the Department of Defense and/or major telecommunications services or equipment providers (e.g., Nortel Networks, Lucent, Alcatel, AT&T, Time Warner Cable). The experience must include at least four (4) years of experience installing C4ISR equipment for the Department of Defense and include at least two (2) years of experience working on US Navy Shore C4ISR installations.

a. **Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall be able to understand and comply with drawings completed in accordance with the SPAWAR Shore Installation Process Handbook. They must be able to climb ladders and work in confined spaces. They shall be highly skilled and experienced in the safe, effective, and efficient use of common installation power and hand tools including hand-held saws, drills (including hammer drills), hole punches, levels, crimpers, fusion splicers, and conduit benders. Personnel shall demonstrate a consistent record of good workmanship and compliance to standards. Personnel shall demonstrate approximately average speed and skill when performing tasks such as attaching fiber optic connectors, RJ-45 connectors, and DB type connectors. Personnel shall demonstrate advanced speed and skill when performing tasks such as dressing cable installations so that the finished product presents a well organized and professional appearance. They shall also be skilled in the operation of all commonly used installation test equipment. This includes spectrum analyzers, voltmeters, VSWR meters, Bit-Error Rate Test Sets, and Category 5e/6 cable testers.

## **23. Engineering Technician 2**

### **23a. Shore Installation Engineering Technician, Level 2**

**Education:** Personnel qualifying for this position shall have one of the following:

a. An Associates Degree or higher in Electrical Engineering, Electronics Technology, or Information Technology

b. Completion of four (4) years of U.S. military service with one of the following technical ratings – Electronics Technician with Advanced Training, Interior Communication (IC) with Advanced Training, Information System Technician (IT), Radioman (RM) (legacy rating), or Data System Technician (DS) (legacy rating)..

c. Completion of a formal two year or more contractor apprenticeship in a related field that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations.

**Credentials:** Personnel shall have the following:

a. Cardio Pulmonary Resuscitation (CPR) Certification

b. BICSI ITS Installer 1 credential

c. Valid Driver's License

**Experience:** Personnel qualifying for this position shall have a total of at least three (3) years of practical experience as an installer of Shore C4ISR equipment for the Department of Defense and/or major telecommunications services or equipment providers (e.g., Nortel Networks, Lucent, Alcatel, AT&T, Time Warner Cable). The experience must include at least two (2) years of experience installing C4ISR equipment for the Department of Defense and include at least one (1) year of experience working on US Navy Shore C4ISR installations.

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall be able to understand and comply with drawings completed in accordance with the SPAWAR Shore Installation Process Handbook. They must be able to climb ladders and work in confined spaces. They shall be competent in the safe, effective, and efficient use of common installation power and hand tools including hand-held saws, drills (including hammer drills), hole punches, levels, crimpers, fusion splicers, and conduit benders. Personnel shall demonstrate a consistent record of good workmanship and compliance to standards. Personnel shall demonstrate approximately average speed and skill when performing tasks such as attaching fiber optic connectors, RJ-45 connectors, coaxial connectors, and DB type connectors. Personnel shall demonstrate approximately average speed and skill when performing tasks such as dressing cable installations so that the finished product presents a well organized and professional appearance. They shall also be skilled in the operation of some commonly used installation test equipment.

**23b. Electronics Assembler, Level 2**

**Education:** High School diploma or GED.

**Experience:** Three (3) years of experience, to include: performing fabrication and assembly or repair of electromechanical and electronic assemblies per fabrication/assembly drawings. Experience shall include soldering with low wattage (under 30 watts) soldering devices, assembling cable harnesses, and making high density electrical cable connectors, coaxial connectors and waveguide connectors

**Skills and Abilities:** Personnel qualifying for this position shall have the ability to follow assembly drawings and instructions including Cable Running Sheets and to produce product that shows an excellent level of workmanship.

**23c. Mechanical Assembler, Level 2**

**Education:** High School diploma or GED.

**Experience:** Three (3) years of experience, to include performing maintenance, repair, fabrication and precision assembly of mechanical assemblies per fabrication/assembly drawings. This experience must include the use various tools such as drills, soldering guns, and other hand held tools, assembling both large scale and intricate mechanical assemblies and working with blueprints, assembly drawings and sketches.

**Skills and Abilities:** Personnel qualifying for this position shall have the ability to follow assembly drawings and instructions and to produce product that shows an excellent level of workmanship.

**24. Engineering Technician 1**

**24a. Shore Installation Engineering Technician, Apprentice**

**Education:** Personnel qualifying for this position shall have a high school diploma.

**Experience:** None.

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall be able to climb ladders and work in confined spaces. With guidance from senior personnel, personnel shall be able to follow drawings prepared in accordance with the SPAWAR Shore Installation Process handbook. Personnel must possess sufficient vision and dexterity to grasp and align objects like DB connector pins. Personnel must have sufficient physical strength to lift and hold heavy drills and saws steady while in operation. Personnel must also be able to lift and carry tool boxes and equipment weighing up to 50 pounds.

**24b. Electronics Assembler, Level 1 (Apprentice)**

**Education:** High School diploma or GED.

**Experience:** No experience is required.

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall have good hand-eye coordination and fine motor skills.

**24c. Mechanical Assembler, Level 1 (Apprentice)**

**Education:** High School diploma or GED.

**Experience:** No experience is required.

**Knowledge, Skills, and Abilities:** Personnel qualifying for this position shall have good hand-eye coordination and fine motor skills.

## **25. Electronics Technician 3**

### **25a. Shipboard Supervisory Electronics Installation Manager**

**Education:** One of the following: Associate's Degree in Electrical Engineering, Electronics Technology, Information Technology, Class A military school in electronics or communications, IT specialist title in US military, four (4) year electronics apprentice program, two (2) year contractor apprenticeship that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations.

**Experience:** Eight (8) years of practical experience, to include: Electronics Repair, Maintenance, Installation and Checkout. Two (2) years experience, to include: supervision, and shop practices. Three (3) years practical experience, to include: electronics repair and installation. Six (6) years experience with shipboard electronics installations to include: reading, interpreting and working from blueprints, drawings, manuals, handbooks and technical specifications; electronics equipment installation including the installation of electronic equipment, ducts, cableways, fiber cables, high density cable connectors, RF cable connectors, waveguides and antennas; supervising the installation activities of installation teams including sub-contractor teams; managing installation efforts aboard US Navy afloat platforms. Knowledge of proper standards of conduct and shipboard etiquette.

### **25b. Shipboard C4ISR Installation Technician, Senior**

**Education:** One of the following: Associate's Degree in Electrical Engineering, Electronics Technology, Information Technology, Class A military school in electronics or communications, IT specialist title in US military, four (4) year electronics apprentice program, two (2) year contractor apprenticeship that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations. Driver's License. Must have the following certifications whenever they are applicable to the work being performed: Cableway Certification, Cableway Inspector Certification, Multi-pin Connector Certification, Fiber Optic Connector Certification, Visual TEMPEST Inspector Certification, Shipyard Competent Person Certification, Cardio Pulmonary Resuscitation (CPR) Certification, Man Aloft Certification (Climber Certification).

**Experience:** Eight (8) years of practical experience working on US Navy or Coast Guard afloat C4ISR installations with at least four (4) years of experience working to include: Electronics Repair, Maintenance, Installation and Checkout.

## **26. Electronics Technician 2**

### **26a. Shipboard C4ISR Installation Technician**

**Education:** One of the following: Associate's Degree in Electrical Engineering, Electronics Technology, Information Technology, Class A military school in electronics or communications, IT specialist title in US military, two (2) year electronics apprentice program, two (2) year contractor apprenticeship that included at least six months of formal classroom training that addressed electrical circuit theory, electromagnetic radiation, and other disciplines related to C4ISR installations. Driver's License. Must have the following certifications whenever they are applicable to the work being performed: Cableway Certification, Cableway Inspector Certification, Multi-pin Connector Certification, Fiber Optic Connector Certification, Shipyard Competent Person Certification, Cardio Pulmonary Resuscitation (CPR) Certification, Man Aloft Certification (Climber Certification).

**Experience:** Four (4) years of practical experience working on DoD C4ISR installations with at least two (2) years of experience working on US Navy US Navy or Coast Guard shipboard C4ISR installations, to include: Electronics Repair, Maintenance, Installation and Checkout.

**26b. C4ISR System/Equipment Operations and Test Specialist**

**Education:** High School diploma or GED. Formal electronics training from: Technical School, or Class A or B military school in electronics or communications, two (2) year contractor apprenticeship that included at least six months of formal classroom training that addressed Installation Tasks, Soldering, Cable Dressing, Cable Tray, Conduit, and Making/Repairing Connectors. For each Navy C4ISR system that they are tasked to work on, specific system training that qualifies them to operate and maintain it

**Experience:** Four (4) years of military experience in operating and maintaining the specific systems that they are tasked to work on under this contract. Two (2) years of practical experience, to include: electronics repair, maintenance and checkout. Specific experience: training others in the use and maintenance of the specific systems that they are tasked to work on under this contract, developing written training materials, performing system recovery of systems that have been improperly configured by untrained personnel, performing and documenting SOVT testing for the that they are tasked to work on under this contract.

**27. Electronics Technician 1**

**27a. C4ISR Installation Technician, Shipboard, Apprentice**

**Education:** High School diploma or GED. Formal electronics training from: Technical School, or Class A or B military school in electronics or communications, two (2) year contractor apprenticeship that included at least six months of formal classroom training that addressed Installation Tasks, Soldering, Cable Dressing, Cable Tray, Conduit, and Making/Repairing Connectors. Driver's license. Must have the following certifications whenever they are applicable to the work being performed: Shipyard Competent Person Certification, Cardio Pulmonary Resuscitation (CPR) Certification, Man Aloft Certification (Climber Certification).

**Experience:** Two (2) years of practical experience, to include: electronics repair, maintenance and checkout.

**28. Heating, Ventilation, and Air Conditioning Mechanic, EPA MVAV Certified**

**Education:** High School Diploma or GED. EPA MVAC Technician Certification.

**Experience:** Two (2) years of experience, to include: heating, ventilation, and air conditioning installations, and repairs of USN shore and shipboard facilities. Experience mounting compressor and condenser units by following blueprints or engineering specifications. Also, experience in the installation of ventilation duct and fan coil units on chilled water systems.

**29. Heating, Ventilation, and Air Conditioning Mechanic, Basic**

**Education:** High School Diploma or GED.

**Experience:** One (1) year of experience, to include: heating, ventilation, and air conditioning installations, and repairs of USN shore and shipboard facilities and experience in the installation of ventilation duct and fan coil units on chilled water systems.

**30. Drafter/CAD Operator 4**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. An associate's degree in drafting or an engineering discipline; or
- b. AutoDesk Professional Level Certification in AutoCAD.

**Experience:** Five (5) years of drafting experience producing drawings files compatible with AutoCAD software. This shall include at least three (3) years experience in developing, preparing, reviewing and editing drawings used to plan or document the installation of Navy C4ISR systems.

**Knowledge, Skills and Abilities:** Personnel shall be able to demonstrate that they possess an excellent ability to produce clear and accurate drawings free of errors. Personnel at this level shall have a thorough knowledge of the Drafting standards discussed or contained in the SPAWAR Installation Requirements Drawing (IDR) Standard and in Appendix Q of the Shore Installation Process Handbook (SIPH) – including a detailed knowledge of the IDEA standard. The drafter/CAD Operator shall be able to accurately represent physical objects in three dimensions in model space in AutoCAD when this is required by the task order or otherwise necessary. The

drafter/CAD Operator shall be capable of utilizing database tools in the possession of the contractor to efficiently and accurately develop consistent parts list.

**31. Drafter/CAD Operator 3**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. An associate's degree in drafting or an engineering discipline; or
- b. AutoDesk Professional Level Certification in AutoCAD.

**Experience:** Three (3) years of drafting experience producing drawings files compatible with AutoCAD software. This shall include at least two (2) years experience in developing, preparing, reviewing and editing drawings used to plan or document the installation of Navy C4ISR systems.

**Knowledge, Skills and Abilities:** Personnel shall be able to demonstrate that they possess an excellent ability to produce clear and accurate drawings free of errors. Personnel at this level shall have an in-depth knowledge of the Drafting standards discussed or contained in the SPAWAR Installation Requirements Drawing (IRD) Standard, Appendix Q of the Shore Installation Process Standard (SIPH) (includes the IDEA standard developed by and for shipyards), and NAVSEA Technical Specification 9090-600, Ship Alteration (ShipAlt) Installation Drawing (SID) Preparation. The drafter/CAD Operator shall be able to accurately represent physical objects in three dimensions in model space in AutoCAD when this is required by the task order or otherwise necessary. The drafter/CAD Operator shall be capable of utilizing database tools in the possession of the contractor to efficiently and accurately develop consistent parts list.

**32. Drafter/CAD Operator 2**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. Associate's degree in drafting or an engineering discipline; or
- b. AutoDesk Professional Level Certification in AutoCAD.
- c. AutoDesk Associate Level Certification in AutoCAD and one year of experience as an installer.

**Experience:** Two (2) years of drafting experience producing drawings files compatible with AutoCAD software. This shall include at least two (2) years experience in developing, preparing, reviewing and editing drawings used to plan or document the installation of Navy C4ISR systems.

**Knowledge, Skills and Abilities:** Personnel shall be able to demonstrate that they possess an excellent ability to produce clear and accurate drawings free of errors. Personnel at this level shall have an in depth knowledge of the Drafting standards discussed or contained in the SPAWAR Installation Requirements Drawing (IRD) Standard. In addition, personnel at this level shall have an in-depth knowledge of either Appendix Q of the Shore Installation Process Standard (SIPH) – or NAVSEA Technical Specification 9090-600, Ship Alteration (ShipAlt) Installation Drawing (SID) Preparation. The drafter shall be able to efficiently represent objects in two dimensions in model space when this is required by a task order or otherwise necessary.

**33. Drafter/CAD Operator 1**

**Education:** Personnel qualifying for this position shall have one of the following:

- a. Associate's degree in drafting or an engineering discipline; or
- b. AutoDesk Professional Level Certification in AutoCAD.
- c. AutoDesk Associate Level Certification in AutoCAD and one year of experience as an installer of C4ISR systems.

**Experience:** No experience is required.

**Knowledge, Skills and Abilities:** Personnel shall be able to demonstrate that they possess an ability to produce clear and accurate drawings free of errors. Personnel at this level shall be familiar with the content of the Drafting standards discussed or contained in the SPAWAR Installation Requirements Drawing (IDR) Standard and in either Appendix Q of the Shore Installation Process Standard (SIPH) or NAVSEA Technical Specification 9090-600, Ship Alteration (ShipAlt) Installation Drawing (SID) Preparation. The drafter shall be able to efficiently represent objects in two dimensions in model space when this is required by a task order or otherwise necessary.

**34. Administrative Assistant 3**

**Education:** Associate's Degree in Business or Computer Science.

**Experience:** Four (4) years experience, to include: word processing, spreadsheet development, documenting management issues, financial analysis, data collection, report processing, brief preparation, read milestone schedules, send and receive emails, making travel arrangements, forwarding security related documentation. Two (2) years work experience shall be within DoD or DoD Contractor organizations.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type at least 40 words per minute for 3 continuous minutes.

OR

**Education:** High School Diploma or GED.

**Experience:** Eight (8) years experience to include: word processing, spreadsheet development, documenting management issues, financial analysis, data collection, report processing, brief preparation, read milestone schedules, send and receive emails, making travel arrangements, forwarding security related documentation. Two (2) years work experience shall be within DoD or DoD Contractor organizations.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type 40 words per minute.

**35. Administrative Assistant 2**

**Education:** Associate's Degree in Business or Computer Science.

**Experience:** Two (2) years experience, to include: word processing, spreadsheet development, documenting management issues, financial analysis, data collection, report processing, brief preparation, read milestone schedules, send and receive emails, making travel arrangements, forwarding security related documentation. One (1) years work experience shall be within DoD or DoD Contractor organizations.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type 40 words per minute.

OR

**Education:** High School Diploma or GED.

**Experience:** Four (4) years experience to include: word processing, spreadsheet development, documenting management issues, financial analysis, data collection, report processing, brief preparation, read milestone schedules, send and receive emails, making travel arrangements, forwarding security related documentation. One (1) years work experience shall be within DoD or DoD Contractor organizations.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type 40 words per minute.

**36. Administrative Assistant 1**

**Education:** Associate's Degree in Business or Computer Science.

**Experience:** No experience required.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type 20 words per minute.

OR

**Education:** High School Diploma or GED.

**Experience:** No experience required.

**Knowledge, Skills and Abilities:** Knowledge of privacy act requirements. Ability to type 40 words per minute.

**37. Supply Technician**

**Education:** High School Diploma or GED.

**Experience:** Personnel qualifying for this position shall have at least four years of professional experience in the supply field.

**Knowledge, Skills and Abilities:** Personnel qualifying for this position shall be proficient in:  
a. The use of variety of websites for obtaining parts and material information such as WebFLIS ([http://www.dlis.dla.mil/webflis/pub/pub\\_search.aspx](http://www.dlis.dla.mil/webflis/pub/pub_search.aspx)).

- b. Negotiating to obtain equipment and material at competitive prices
- c. Inspecting received equipment and material for correctness and condition
- d. Preparing material for shipment and storage
- e. Tracking material orders and shipments
- f. Advanced use of a computerized inventory system
- g. Complying with requirements for handling hazardous material commonly used in installations (e.g., paint, cleaning solvents, lithium batteries)
- h. Warehouse planning and management
- i. Forklift operation
- j. Determining and maintaining inventory levels for commonly used materials (e.g., #10-32 x 1/2" screws)

### 38. Warehouse Specialist

**Education:** High School diploma or GED.

**Experience:** Two (2) year of warehouse duties experience, to include: performing receiving inspection, inventory, staging, packing, storage and shipping of electronic equipment and related material; operating motor vehicles and material handling equipment (e.g., forklifts); utilizing a computer-based inventory and bar coding system for entry, identification and tracking of material. Knowledge and enforcing compliance with requirements for handling hazardous material commonly used in installations (e.g., paint, cleaning solvents, lithium batteries, other).

### 39. Heavy Equipment Operator

**Education:** Personnel qualified for this position shall possess a high school diploma or GED.

**Credentials:** Personnel qualified for this position shall possess a valid Commercial Driver's License. Personnel qualifying for this position shall possess any special licenses or certifications needed to be able to operate the heavy equipment that they are using (Requirements can vary from state to state.).

**Experience:** Personnel qualifying for this position shall have certificate showing that they graduated from a technical school where they received training in the operation of the type of equipment that they operate or shall have received adequate (at least 40 hours) of on-the-job training in operating the specific heavy equipment type while under the supervision of a senior heavy equipment operator with over one year of experience (using the specific equipment type).

**Knowledge:** Personnel shall be familiar with the OSHA regulations that apply to the type of work that they are performing. Personnel shall be able to read and interpret grades, slope stakes, and simple plans. Personnel shall be able to grease, adjust, and perform normal user maintenance on the equipment being operated.

### 40. Welder

**Education:** High School Diploma or GED.

**Credentials:** Must pass employer performance tests, and possess the applicable governmental agency, professional association, or technical association certifications. Qualified for specific material and processes in accordance with American Welding Society Welding Handbook if assigned to weld at shore facilities. Shall be Occupational Safety/Haz-Mat Certified. Shall be Confined Space Entry Certified if the certification is applicable to the work being performed. Qualified under NAVSEA TECH PUB S9074-AQ-GIB-010/248 (0910-LP-731-4500) to do all plate and pipe welding on non-nuclear systems made of S1, S2, S4, S5, S11A, and S11B material using Groups A5A, 5D, A2A, 3A, 4A, 6A, 7A1, A2, and A1A filler metal. When applicable to the work being performed, welders shall possess a Shipyard Competent Person Certification, or Man Aloft Certification (Climber Certification).

**Experience:** Four (4) years experience, to include: electric arc, gas shielded arc, and gas welding. Proficient at welding as follows: executing welds in all positions, with all types of metals and alloys, in various shapes including pipes, structural forms, plates, sheet metal, bar stock, machinery and equipment.

### 41. Rigger

**Education:** High School Diploma or GED. Completion of Rigging and Safety apprenticeship training programs.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Shipyard Competent Person Certification, Man Aloft Certification (Climber Certification), Driver's license.

**Experience:** Four (4) years of experience, to include: assembling rigging to lift/move equipment or material; selecting cables, ropes, pulleys, winches, blocks, and sheaves, according to weight and size of load; providing directions to Crane Operators to insure safety of workers and material; and repairing rigging equipment.

## **42. Electrician, Maintenance**

### **42a. Shipboard Electrician**

**Education:** High School Diploma or GED. Must pass employer performance tests, standard governmental agencies certifications, and professional and technical association certifications for electricians.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Shipyard Competent Person Certification, Cardio Pulmonary Resuscitation (CPR) Certification, Man Aloft Certification (Climber Certification).

**Experience:** Four (4) years of experience, to include: installation, maintenance, or repair of equipment for the generation, distribution, or utilization of electric energy (e.g., generators, transformers, switchboards, controllers, circuit breakers, motors, heating units, conduit systems, etc), working from blueprints or drawings, troubleshooting electrical systems, and working standard computations related to load requirements of wiring or electrical equipment. Specific experience: Three (3) years of shipboard electrical repair and installation.

### **42b. Shore Electrician**

**Education:** High School Diploma or GED.

**Credentials:** Electrician's license from a state or territory of the United States that is valid where the electrician is working.

**Experience:** Four (4) years of experience in shore electrical wiring installations, to include: experience in installing power panels, electrical outlets, circuit breakers, and EMT conduit. Three (3) years of experience installing electrical wiring for DoD Communications or Electronics Facilities.

**Knowledge:** In-depth Knowledge of the National Electrical Code (NFPA 70), the Standard for Electrical Safety in the Workplace (NFPA 70E), and of the electrical guidance in Appendix AC of the SPAWAR Shore Installation Process Handbook.

## **43. Machinist**

**Education:** High School Diploma or GED is required for this position. Personnel qualifying for this position shall have a high school diploma and shall have completed a formal apprenticeship as a machinist or have completed formal machinist training established by NIMS accredited training facilities, State apprenticeship boards, and accredited colleges implementing curriculums that incorporate national skills standards developed by the National Institute of Metalworking Skills (NIMS).

**Credentials:** Personnel qualifying for this position and working in a shipyard environment shall be able to demonstrate that they possess Shipyard Competent Person Certification.

**Experience:** Personnel qualifying for this position shall have one of the following:

- a. Four (4) years experience as a machinist including two (2) years performing shipboard related jobs and in the layout and fabrication of metal structural parts such as plate, bulkheads, and frames, which includes bracing them in position for riveting or welding and two (2) years experience in making jigs, patterns, and templates using various machine shop tools, or
- b. The eight distinct credentials in Machining Level I and the seven distinct credentials in Metal Stamping Level from the National Institute for Metalworking Skills (NIMS), or
- c. Journeyworker (journeyman) certification obtained from State or Commonwealth apprenticeship boards after completing an apprenticeship.

**44. Pipefitter, Maintenance**

**Education:** High School Diploma or GED. Completion of Pipefitter apprenticeship training program.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Driver's license, Shipyard Competent Person Certification, Man Aloft Certification (Climber Certification).

**Experience:** Four (4) years of experience, to include: installing or repairing water, steam, gas or other types of pipe and pipefitting; measuring to locate position of pipes from drawings/specs; cutting pipes with chisel, oxyacetylene torch or pipe cutting machines; making standard shop computations relating to pressures, flow, and size of pipe required. Specific experience: three years (3) of shipboard experience in assembling, installing, and repairing pipes, tubing, waveguide, heat exchangers, fixtures and fitting associated with electronic systems, cooling, and air pressurization systems; working from blueprints, drawings and manuals.

**45. Painter, Maintenance**

**Education:** High School Diploma or GED.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Driver's license, Shipyard Competent Person Certification.

**Experience:** Four (4) years of experience in the field of spray painting and hand brushing of enamel, lacquer, acrylics, two part epoxies, latex paints, primers etching and rust proofing agents on wood stock, metals, plastics, composites, stencils, and fabricated items; preparation of surfaces for priming and finish painting. One (1) year of experience in the application of powder coating to steel and aluminum surfaces.

**46. Powder Coat Applicator**

**Education:** High School Diploma or GED.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Shipyard Competent Person Certification.

**Experience:** Two (2) years of experience in the preparation of surfaces for and the application of powder coating to steel and aluminum surfaces.

**47. Sheet-Metal Worker, Maintenance**

**Education:** High School Diploma or GED. Completion of Sheet-Metal apprenticeship training program.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Shipyard Competent Person Certification.

**Experience:** Four (4) years of experience, to include: fabricating, installing and maintaining sheet metal equipment and fixtures; planning and laying out sheet metal work from blueprints, models or specifications; setting up and operating all types of sheet metal tools and machines. Specific experience: making air ducts, boxes, chassis, and lightweight frames, tack welding, light brazing, and metal soldering various metals and alloys used in sheet metal fabrication, constructing or adapting on site installations made from their own measurements and constructed specifically for the locations where the work is being accomplished. Experience using welding equipment, operating hand and power brakes, drill presses, shears, punches, other power and hand tools. Experience in the formation of custom sections of cable duct and cable trays.

**48. Maintenance Trade Helper**

**Education:** High School Diploma or GED.

**Credentials:** Shall possess any of the following certifications that apply to the work being performed: Shipyard Competent Person Certification, Driver's License, Man Aloft Certification (Climber Certification), Cardio Pulmonary Resuscitation (CPR) Certification

**Skills and Abilities:** Personnel qualifying for this position shall have manual dexterity, eye-hand coordination, and an ability to work as a member of a team and to learn a trade (painting, pipe fitting, etc.).

**49. Laborer**

**Education:** High School Diploma or GED.

**Credentials:** Laborers who will be assigned to work in a shipboard environment shall have Shipyard Competent Person Certification and Man Aloft Certification (Climber Certification).

**Experience:** None required.

**Skills and Abilities:** Personnel qualifying for this position shall have manual dexterity, eye-hand coordination, good physical fitness, a good sense of balance, and an ability to work as a member of a team. Laborers must be capable of lifting and carrying objects weighing up to seventy pounds and of spending up to eight hours per day performing physical demanding work. A laborer shall be able to:

- a. Load and unload trucks
- b. Use wheelbarrows and hand trucks
- c. Stack materials up to five feet high
- d. Dig, fill, tamp, and level earth excavations using hand tools
- e. Cut trees and brush
- f. Move and arrange heavy pieces of electronic equipment, office furniture, and appliances - with assistance from other laborers
- g. Pull cable under supervision
- h. Climb ladders
- i. Position, join, align, wrap and seal pipe and conduit sections.
- j. Place and test plastic conduit for electrical and communications cable, when the conduit is buried underground.
- k. If properly trained, operate light machinery, equipment, and power tools.
- l. Stoop, kneel, crouch, and crawl.