DCMA NSEO MANUFACTURING PROCESS REVIEW (MPR) CHECKLIST #18

ELECTRICAL TESTING

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| **SUPPLIER & CAGE:**  |  |
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| **LOCATION:** |  |
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| **PROCESS REVIEWED:** |  |

**Program Type:**

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|  | Level I/SUSBAFE (LI/SS) |  | Navy Propulsion Program (NPP) |  | Deep Submergence Systems/Scope of Certification Program (DSS-SOC) |
|  | Nuclear Plant Material (NPM) |  | Naval Nuclear Propulsion Program (NNPP) |  | Aircraft Launch & Recovery Equipment (ALRE) |
|  | Fly By Wire Ships Control Systems (FBWSCS) |  | Ships Critical Safety Items (SCSIs) |  | Other: |

**Contractual Requirement(s) for this Process:**

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**Supplier Procedure Number(s), Title(s) & Revision Level(s)/Date(s):**

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| **Process Reviewed By:**  |  |
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| **Date(s) of Review:** |  |
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**Process Concerns and Guidance:**

**Class 1 — General Electronic Products:** Includes products suitable for applications where the major requirement is function of the completed assembly.

**Class 2 — Dedicated Service Electronic Products:** Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically the end-use environment would not cause failures.

**Class 3 — High Performance Electronic Products:** Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

* Material Control is the foundation for the Level I program, ensure this is being followed.
* Proper classifications of assemblies for evaluation not properly classified (Class 1, 2, 3) or being inspected to the correct class
* Programmable Read-Only Memory components (PROM) were burned incorrectly. The software/part/drawing numbers were correct, but the software used was the wrong version. All three must be verified separately.
* Harness assemblies were of an incorrect configuration.
* Insulation pinched between a lug and terminal seating surface caused a high resistance connection.
* Environmental testing not complied with or proper posttest inspection unsat
* Are securing mechanisms being applied/installed properly?
* Are all marking requirements, including nameplates, as required?
* Is configuration management under control?

**A**. **MANPOWER:**

1. Are the people performing the manufacturing, testing, and quality assurance functions of the appropriate skill/experience level and/or properly trained/certified to produce conforming product? ***Are test personnel qualified for the observed testing procedure? Are they familiar with details of the procedure? What is the procedure number?***

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1. Are personnel performing electrical tests knowledgeable, trained and qualified with the procedure, use of tools and use of instruments? Is this recorded and part of employee’s file, if required? ***Are training records available (review sample) and are they accurate and complete?* (NAV18-A10)**

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1. What type of training/certification is required? Is anyone’s certification expired and are they still working in the process? ***What are the requirements (some specifications have specific operator qualification requirements)?***

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1. Are the credentials of the training/certification official in accordance with specification requirements? *What are the requirements?*

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1. Is there a system in place for remedial training when errors occur?

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1. Is raw inspection data reviewed and accepted by qualified personnel? (NAV18-A16)

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1. Does the supplier train personnel or have an awareness program for ESD precautions? (NAV18-A12)

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**B. MATERIALS**:

1. For Level I material, is the product controlled and traceable throughout the process? What is the procedure?

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1. Are electrical tests performed on materials that contain ESD sensitive components? Are special precautions observed? (NAV18-A13A/B).

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1. Are electrical materials controlled for part obsolescence? Is it within shelf life, if applicable? ***(There are shelf lives for various materials. Check the manufacturer’s certification or appropriate data for this information.)***

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1. Does the supplier have a procedure for the counterfeit detection and avoidance system? Are electrical materials controlled for counterfeit mitigation? **(*Check the manufacturer’s certification or appropriate data for this information.)***

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**C. MACHINERY:**

1. Is instrumentation utilized during electrical tests part of the calibration program? Is equipment adequate to produce conforming supplies in compliance with contractual specifications and drawing(s)? ***What items of equipment were sampled and were they within the calibration/check cycle?*** (NAV18-A8)

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1. Are instruments, unique numbers of meters, probes, scopes, meggers, etc… recorded on test result documents? **Record a sample.** (NAV18-A9)

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1. Is manufacturing equipment “stickered” to indicate calibration next due date?

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1. Is **inspection and testing equipment** of the required adequacy, accuracy, precision, and range to assure supplies produced comply with specifications and drawings? *What Items were sampled and were they part of the supplier’s calibration program and within the calibration/check cycle?*

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1. Does equipment (to include fixtures, jigs, and software [ATE]), requiring qualification or certification approval, have contractual approval for use?

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1. Is software used in running manufacturing, measuring and testing equipment (ATE) correct and/or approved to assure product complies with specifications and drawing?  ***What program(s) and revision level(s)/date(s) was reviewed?***

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1. Is Government owned equipment adequately protected / maintained in accordance with a documented process?

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**D**. **METHODS**:

1. Does the supplier have an approved electrical test procedure if required? *Has the test procedure been approved by the Navy/customer?* ***If applicable, list the procedure and Reference Approval Number.*** (NAV18-A3)

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1. Are work instructions, test procedures, travelers, etc. being used adequate, clear, concise and up to date (latest revision) to allow only contractually conforming supplies to be delivered to the Government? ***What documents (identifying number & rev) were reviewed?***

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1. Are all electrical tests performed and recorded in accordance with the procurement spec, specifications or drawings?(NAV18-A1/A2)

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1. Does the electrical test procedure require special safety precautions? (NAV18-A4)

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1. Are electrical tests performed on samples or 100% for production lots? If sampled, list sample size and criteria used; or enter 100% in block below. (NAV18-A5/A6)

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1. Do procedures/work instructions, specification or drawings require isolation of specific circuit during electrical testing? Were circuit isolations documented on test reports? (NAV18-A14A/B)

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1. Are special precautions required after electrical tests are performed (i.e. discharge time for motors, transformers, etc.)? Are these precautions documented on the test report? (NAV18-A15A/B)

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1. Are other tests required to be performed in conjunction with electrical testing (i.e. Hydro?) (NAV18-A17)

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1. Does an electrostatic discharge (ESD) program exist at the facility? (NAV18-A11)

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1. Does the wire/cable manufacturer perform in-process spark testing while producing wire/conductors? (NAV18-A18)

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1. Does the process allow for the production line to "stop" to flag the defective area? (NAV18-A19)

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1. Does the manufacturer perform electrical tests after each production operation (example: insulation resistance after twisting/shield operation)? (NAV18-A20)

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1. Does a procedure exist to detect production splices? NOTE: Splices are not allowed in finished cables. (NAV18-A21)

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1. Are the numbers of production splices recorded on work-in-process documents and accounted for after final cable production? (NAV18-A22)

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1. Are cable production personnel knowledgeable of in-process/methods for detecting flaws (opens, shorts, etc.)? Record if procedures are readily available; record if non-conformances are documented, if applicable. (NAV18-A23A/B)

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1. Are final electrical tests performed IAW the applicable specification or procurement spec? (NAV18-A24)

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1. Are special precautions taken after electrical tests to prevent damage to product (example: Seal ends of cable to prevent moisture contamination, protection of cable jackets/sheathing, etc.)? (NAV18-A26)

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1. Are shipping reels size, O.D. in accordance with the specification or procurement spec? (NAV18-A27)

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**E.** **ENVIRONMENT**:

1. Is the work being performed in an area that is clean and free from dirt and debris?

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1. Does the supplier observe environmental ESD practices, if applicable?

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1. Are electrical tests performed in an environmentally controlled area? Is it suitable for the tests?(clean room). Are humidity, temperature and barometric pressure monitored and recorded? (NAV18-A7/A25)

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**F. PRODUCT EXAMINATION:**

***The QAR must perform a product examination in order to verify the output of the process being reviewed and document the results below.***

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| Date(s) Conducted: |  |
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| Product Examination Performed By: |  |
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| Contract Number(s): |  |
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| Part Number(s)/Serial number(s): |  |
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| Part Nomenclature(s): |  |
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| Supplier Personnel Contacted and Titles: |  |
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| Drawing Number & Revision: |  |
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| Lot Size and Sample Size: |  |

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| Characteristics Examined: | # Observations |
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1. Identify the inspection methods (W, I, T, V) used to verify conformance with procedures and standards:

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| **W** |  |  | **I** |  |  | **T** |  |  | **V** |  |

**PE Comments/Concerns**

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| **Overall MPR Results:** | **SATISFACTORY** |  | **UNSATISFACTORY** |  |

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| **Corrective Action Generated?** | **No** |  |  | **Yes** |  |  | **CAR#** |  |

FOLLOW-UP ACTION REQUIRED?

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**SUMMARY/NOTES/COMMENTS/CONCERNS**:

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