DCMA NSEO MANUFACTURING PROCESS REVIEW (MPR) CHECKLIST #03UT

ULTRASONIC TESTING

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| **SUPPLIER & CAGE:**  |  |
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| **LOCATION:** |  |
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**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:**

* Improper Scanning Speed, either dynamically during scan or in relation to calibration, limits the effectiveness of an inspection by limiting the inspector’s ability to detect and evaluate indications.
* Insufficient coverage of the full area of interest.
* Surface conditions of calibration standards should be equal to or rougher than the part to be inspected.
* Calibration/setup not performed properly, and to the procedure requirements.
* Calibration standards not properly and uniquely identified.
* Couplant not removed at conclusion of inspection.
* No system in place to qualify equipment, including master transducers and calibration blocks.
* Scans not performed in the correct direction (parallel, transverse, axial, circumferential), and in opposing directions.
* Attenuation checks not performed.
* Correct calibration of the equipment, including correct calibration blocks.
* Incomplete scanning or operator inattention will greatly reduce the sensitivity of the inspection.
* Standards used for calibration must be sized appropriately for the entire range of tolerances allowed by part thickness to ensure proper sensitivity.

**Governing Specifications**:

* NAVSEA 250-1500-1
* MIL-STD-2132
* T9074-AS-GIB-010/271

**Additional Oversight Checklists**

* Addendums to this MPS checklist are available to use for a more in-depth process surveillance. If used, the completed Addendum(s) are to be attached to the PDREP Surveillance Plan with the base checklist.

* 03 MPR-MPS - Addendum 1 – NDT Qualification, Certification and Oversight

**General Instructions for Performing Ultrasonic Testing Process Reviews:**

Navy Supplier contracts may invoke various, governing NDT specifications. This checklist may not include all of the requirements of all of the possible specifications that may be called out in a Navy contract and is, therefore, offered as guidance. It is incumbent upon the QAR to review the governing specifications imposed on the supplier being audited and adjust this checklist accordingly. Additional checklists regarding Mil-STD, ASTM, and personnel certification specifications can be found in the NSEO NDT Toolbox.

Use this over-arching checklist in tandem with the additional, specific checklists. (Example: an audit of an NDT lab for ultrasonic testing may require the use of this checklist, the NAVSEA-250-1500 checklist, the SNT-TC-1a checklist and possibly numerous MIL-STD and/or ASTM checklists.)

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

1. Is there a Written Practice for the control and administration of NDT personnel training, examination, certification and oversight approved by the Level III Examiner? (Addendum 1 available if needed)

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1. Are the personnel performing the inspection and testing functions of the appropriate skill/experience level and/or properly trained/certified to perform the required inspections/tests? ***What are the requirements?***

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1. Record all operations observed (include type and specification, where applicable) and the corresponding inspectors’ names. Are any personnel certifications expired and are they still working in the process? (NAV03-9)

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1. Are all NDT personnel, including the examiner, recertified by examination at a minimum interval as required by specification? (NAV03-3)

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1. Are adequate records available to administer personnel qualification (e.g. name, evidence of examination given, grade, re-certification dates, signature of examiner)? (NAV03-4)

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1. Do records include evidence of performance of applicable NDT during the last 9 months or performance of required surveillance and technical performance evaluations as applicable to maintain qualification? (NAV03-5) ***What are the requirements?***

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1. Are vision test records available? Do vision test records note corrective aids (glasses) when applicable? Do these records indicate a J1 Jaeger test or equivalent brightness discrimination on an annual basis, when applicable? (NAV03-6A/B/7)

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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 corrective action system or remedial training plan in place for when inspector errors occur and is there evidence that it is followed?

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**B. MATERIALS**:

1. Are materials controlled and traceable throughout the process?

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1. Are certifications for materials used in the process reviewed for acceptance and maintained on file for review?

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1. Do the materials comply with contract/specification and/or supplier-imposed technical requirements? ***What were the materials reviewed?***

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1. Are there controls to ensure conforming material is consistently used in the process?

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1. Are materials traceable and identified, as required, and within shelf life, if applicable? ***(There are shelf lives for chemicals. Check the manufacturer’s certification or the chemical drum for this information)***

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**C. MACHINERY**:

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?*(NAV03-45A)

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1. Does equipment, requiring qualification or certification approval, have contractual approval for use?

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1. Identify the NDT equipment available at this facility. Is Government owned equipment adequately protected/maintained in accordance with a documented process?

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1. Are standards, traceable to NIST, available to verify the accuracy of the testing equipment?

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1. Is/Are the calibration block(s) correctly identified by material type and uniquely identified(serialized)? (NAV03-43)

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1. **Note: *Equipment Qualification (as required)* –** Ultrasonic Inspection examination equipment should be checked for performance and accuracy at the time of purchase and at defined intervals thereafter; whenever malfunction is suspected, when specified by the Cognizant Engineering Organization, or whenever electrical maintenance that might affect equipment accuracy is performed. Governing contract NDT specifications will define these requirements. ***What requirements are applicable to this facility? Does the equipment meet these requirements?***

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

1. Is the correct NDT procedure readily available to the inspector and approved (if required)? Identify procedure number, revision, date, and applicable Approval Number (if applicable).(NAV03-2/39A)

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1. Are work instructions, test procedures, travelers, etc. being used current, 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 & revision) were reviewed?***

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1. Do records of UT clearly identify the results of the inspections and tests performed and include traceability back to the procedure, lot/heat numbers of parts tested, instruments used, and personnel who performed each inspection and meet any additional requirements of the applicable specification? (NAV03-46)

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1. Is material/product, which has been through the process, positively controlled, traceable, and have the inspections/tests performed been documented to provide a positive indication of the inspection status of the material (e.g. individual inspected, operation sign-off, inspection stamped/initialed/signed accepted or rejected)?

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1. Are changes to methods (instructions) controlled and distributed adequately and timely to affected personnel?

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1. Is there supplier data available for analysis that can substantiate the effectiveness or ineffectiveness of this process? ***If available, what data was reviewed, and what does the data indicate?***

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1. Is there a system in place to qualify equipment, including master transducers and calibration blocks? (NAV03-41)

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

1. Is the process conducted under controlled environmental conditions (immersion or contact method) as required by contractual and/or supplier-imposed technical requirements? ***What are the environmental conditions and are they monitored (charts, gages, etc., within calibration)?***

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1. Is safety equipment available and in use, if needed? ***What are the safety requirements for this process?***

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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. If at all possible the QAR should witness performance of the inspection/test by supplier personnel to verify competency of supplier personnel.***

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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: |  |

1. Is the inspector properly qualified and performing the NDT in accordance with the correct procedure and meeting all requirements of the applicable NDT specification being performed (proper method/set-up, longitudinal vice transverse, etc…)? (NAV03-39B/40)

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1. Is the surface finish of the piece being tested in accordance with the procedure, equal to or smoother than the calibration standards? (NAV03-42)

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1. Is the couplant completely removed at the completion of testing? (NAV03-44)

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1. Is instrument calibration checked prior to starting inspection, periodically during inspection, as required, and rechecked at the completion of inspection? Is equipment qualification/calibration current?(NAV03-45 a-b)

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1. Does the inspector complete the inspection record properly?

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| Additional PE 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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