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

EDDY CURRENT 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:**  |  |
|  |  |
| **Date(s) of Review:** |  |
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**Process Concerns and Guidance:**

* Improperly performed eddy current inspections could result in acceptance of parts with unacceptable flaws potentially causing a radiation and/or personnel hazard.
* 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
* Inadequately qualified personnel performing inspections
* Inspection procedure and acceptance criteria not available to inspector at workstation
* Incorrect acceptance criteria
* Calibration/setup not performed properly, and to the procedure requirements
* Correct calibration of the equipment, including correct calibration standards
* Calibration standards not properly, and uniquely, identified
* No system in place to qualify equipment, including eddy current probes and calibration blocks
* Equipment calibration is not current
* Thorough scanning of the part tested
* Operator attention to the instrument screen
* Correct recording of the data
* Incorrect calibration, incomplete scanning or operator inattention will greatly reduce the sensitivity of the inspection.

**Governing Specifications**:

* T9074-AS-GIB-010/271 (ET crack detection)
* MIL-STD-2032 (ET of Heat Exchanger Tubing)

**Additional Oversight Checklists**

Addendums to this MPR checklist are available to use for a more in-depth process review. If used, the completed Addendum(s) are to be uploaded to the SAP Database in PDREP with the base checklist.

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

**General Instructions for Performing Eddy Current Inspection 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.Use this over-arching checklist in tandem with the additional, specific checklists. (Example: an audit of an NDT lab for eddy current inspection may require the use of this 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? (NAV03-48)

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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 training records available (review sample) for each certified individual and are they accurate and complete, (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. Was the material's integrity compromised by further processes and/or practices? ***If so, how?***

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**C. MACHINERY**:

1. Is **inspection and testing equipment** of the required adequacy, accuracy, precision, and range to assure components 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. Are calibration reference standards correct (by material type), traceable, properly documented, and uniquely identified as required? (NAV03-50)

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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 calibration standards, traceable to NIST or is certification document, available to verify the accuracy of the testing equipment?

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1. ***Equipment Calibration* -** Eddy Current 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 and being used by the inspector and approved by the cognizant NDT Level III? Identify procedure number, revision, date, and applicable Approval Number (if applicable). (NAV03-2/47A)

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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 inspection records clearly identify the results of the inspections and tests performed and include traceability back to the procedure, lot/heat numbers, instruments used, personnel who performed each inspection, and the finished product inspected? Are these records completed properly, and are they adequate to meet procedural requirements? Are they maintained to confirm that all required inspection processes were performed? ***Record the number of inspection documents sampled for review.*** (NAV03-55)

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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 ET rejectable indications being dispositioned properly (i.e. ET rejects verified by MT)? (NAV03-54)

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

1. Is the process conducted under controlled environmental conditions 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 scanning technique and speed, proper frequency setting for the probe used, etc.)? (NAV03-47b/52/53)

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1. Is the instrumentation used calibrated as required by procedure? (NAV03-51)

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1. Is the surface finish/configuration of the part adequate to allow free movement of the probe? (NAV03-49)

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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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