DCMA NSEO MANUFACTURING PROCESS SURVEILLANCE (MPS) CHECKLIST #03RT

RADIOGRAPHIC TESTING

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| **SUPPLIER & CAGE:**  |  |
|  |  |
| **LOCATION:** |  |
|  |  |
| **Program Type:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 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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| --- | --- |
| Surveillance Performed By:  |  |
|  |  |
| Date(s) of Surveillance: |  |
| Contract Number(s): |  |
|  |  |
| Part Number(s)/Serial number(s)/NSN: |  |
|  |  |
| Part Nomenclature(s): |  |
|  |  |
| Supplier Personnel Contacted and Titles: |  |
|  |  |
| Drawing Number & Revision: |  |

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**Process Concerns and Guidance:**

* Use of an incorrect penetrameter/image quality indicator (wrong material type/group, wrong size, etc...) or improper placement of penetrameter.
* Evaluating radiographic film to the incorrect minimum quality level could result in the acceptance of defective material
* Inadequate supplier radiation safety controls during radiography could result in unsafe conditions and radiation exposure to personnel.
* Inadequate radiographic film processing, handling, and storage could result in the degraded or damaged radiographs.
* Insufficient coverage of the full area of interest.
* Inspection procedure and acceptance criteria not available to inspector at workstation.
* Incorrect acceptance criteria utilized.
* Rough surface conditions or welds can interfere with film interpretation and mask indications.
* Part configuration and/or significant thickness changes make technique development difficult and sometimes costly.
* The cost of radiographic equipment and a shortage of qualified radiographers and examiners cause many suppliers to rely heavily on inspection labs that may not have adequate or verified process controls or NDT programs.
* Conformance to specifications with Radiographic Technique attributes and variables.
* Radiographic records and verification that all indications are identified, evaluated, dispositioned, documented and correlate to the component including inadvertent indications in or out of the area of interest.
* Radiographic Shooting Sketches (RSS) not meeting specification requirements or proper development or approval.

**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

**QARs should use the “BASIS OF DETERMINATION” column to document the objective quality evidence and/or clarify the rationale used to support their decision. (e.g. direct observation, documents verified etc.)**

S = Satisfactory U = Unsatisfactory

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| **SURVEILLANCE QUESTIONS** | **S** | **U** | **BASIS OF DETERMINATION** |
| 1. Are there any Corrective Actions previously issued for RT that will impact this inspection?
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| 1. Is the RT inspector certified in the method being performed? List inspector certification level and expiration dates for vision and NDT certifications.(NAV03-6a-b/7)
 |  |  |  |
| 1. Are procedures available to the personnel performing the task, with clear, correct inspection/acceptance requirement documentation and revisions? Have RT procedures been approved? Record procedures used and approval dates. (NAV03-2/26a-b)
 |  |  |  |
| 1. Does the procedure/technique used meet contract/inspection requirements? Are the RT procedures/techniques being used correctly for the tests being performed?
 |  |  |  |
| 1. Are the product and the materials used to perform the tests controlled and traceable throughout the process?
 |  |  |  |
| 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?***
 |  |  |  |
| 1. Is the film viewing facility constructed to exclude objectionable background lighting? (NAV03-30)
 |  |  |  |
| 1. Is the densitometer used and does it have a 2mm maximum size aperture? Is there a calibrated density test strip within 4 years of package opening? (NAV03-30)
 |  |  |  |
| 1. Does the film viewer have a cooling device to prevent damage or warping of radiographs for 1 minute of continuous contact at the viewing port? (NAV03-30)
 |  |  |  |
| 1. For castings, is there a Radiographic Shooting Sketch (RSS) used? Has the RSS been submitted and approved, when required by the contract?
 |  |  |  |
| 1. Is the extent of radiography (60°, 360°, 25%, 100%, number of areas and items to be radiographed, point in fabrication when radiography is applied) specified in available acquisition documents (drawing, RSS, fabrication etc.) and performed in accordance with them? ***Record all documents reviewed.***
 |  |  |  |
| 1. Is there a system for positive identification (film ID tag or label) of RT film correlating to the part inspected? (NAV03-28)

Does the film ID contain the following; * Identification of the organization making the radiograph
* Date of exposure
* Identification of the part, component or system, and where applicable, the weld joint in the part, component system
* Whether the radiograph is of an original weld or a repair weld
 |  |  |  |
| 1. Are the correct penetrameter(s) used, (size and group)? Are they identified with lead numbers or engraved strips? Is the priciple alloy permanently identified? Is the number used and placement correct? ***Record size, material type/group and number of penetrameters used.*** (NAV03-31/32/33)
 |  |  |  |
| 1. Are radiograph densities in the area of interest within allowable limits? (welds single film view 1.5-4.0, double film view 2.0-4.0, castings single or double film view 1.5-4.0, penetrameter not greater than 15% from the lightest area of interest) (NAV03-38e-g)
 |  |  |  |
| 1. Are location markers used and maintained on the part to permit coordination with their images on the film?

(NAV03-29) |  |  |  |
| 1. Is a sketch, drawing, technique sheet of equivalent record available to show set-up used to make each radiograph and is it legible(NAV03-27a-b)
 |  |  |  |
| 1. Does the Radiographic Shooting Sketch (RSS) or record contain the following information: (NAV03-38)

TP271* Number of films and film type
* Location of each film on the radiographed item
* Orientation of location markers
* Location and orienatation of radiation source
* The kilovoltage and focal spot size of xray machines
* The isotope type, intensity (in curies) and physical dimensions
* Type of material, and material thickness of the radiographed part
* Shim or block material and thickness
* Type of weld joint
* Whether original or repair
* Part or drawing number
* Material groups, penetrameter sizes and types (Mil or ASTM) and required quality level
* Source side or film side penetrameter
* Single or doulble wall viewing
* Type and thickness of intensifying screens and filters
* Location of lead letter “B”
* Appllicable acceptance standard
* Signature of operator (Level I)
* Approved procedure number

 MS2132/NS1500* Identification of the item to be radiographed
* X-ray machine information:

 Model and type Manufacturer Focal spot size Voltage setting* Isotope source information

Type of isotopeSource dimensions* Film type and brand
* Source-to-film distance (SFD)
* Thickness and type of material radiographed
* X-ray kilovolts used
* Number of films in cassette and total number of exposures
* Type and thickness of intensifying screens and filters and their location
* Penetrameter type, identification, and group
* Method of selecting film side penetrameter, when applicable (NS250-1500-1)
* Shim material and thickness when applicable
* Blocking or masking techniques, if used
* A sketch of the speimen radiographed showing:

Direction of radiationPlacement of penetrameter(s)Location of location marker(s)Location of lead letter “B”Location and thickness of back filterLocation of filmLocation of shims if used (NS250-1500-1)* Required radiographic quality level
 |  |  |  |
| 1. Does the radiographic film interpretation/examination record contain the following: (NAV03-38)

TP271* The information specified in item 17 above
* Acceptable and rejectable discontinuities and questionalble suspected surface conditions in the area of interested visually verified and noted
* Date of interpretation
* Disposition (accept or reject) of the item radiographed
* Signature of the radiographic inspector

MS2132* The organizations name
* The signature of the radiographic film interpreter and date of interpretation
* The identification or serial number of the item radiographed
* Single or double wall viewing
* Film viewing, single or superimposed (identify specific radiograph(s) when different film speeds are used)
* Applicable acceptance standards
* Interpretation of each indication, via listing classsification and severity level of the indication, where applicable
* Disposition of each indication (accept or reject)
* Disposition and verification of surface discontinuties
* When applicable, technique and workmanship sample radiographs
* Identification of areas repaired by welding and the number of repair cyles
* A description of the condition requiring use of an SFD less than minimum required, when used

NS1500 (see para. 8.2.1 for weld record requirments) |  |  |  |
| 1. Are all artifacts identified and dispositioned on the interpretation record? (NAV03-37)
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| Other observations: |  |  |  |
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| **Overall MPS 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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