

## **Q220 Nondestructive Test Documentation Requirements SSME Program**

### **Purpose**

The purpose of this code is to define nondestructive test (NDT) data package submittal requirements for Space Shuttle Main Engine (SSME) hardware.

### **Nondestructive Inspections (excluding Radiographic)**

The following Nondestructive Inspection document(s) shall accompany hardware delivered to Buyer. Documents shall be included inside of or securely attached to the outside of the shipping container.

### ***Primary Suppliers***

1. Certificate of Conformance.
2. All Rocketdyne approved NDT Technique Sheet(s).
3. All sub-tier documentation as required below.
4. Any additional documentation required per the NDT specification.

### ***Sub-Tier Suppliers***

1. NDT Certifications/Reports.
2. All Rocketdyne approved NDT Technique Sheet(s).
3. Any additional documentation required per the NDT specification.

### **Radiographic Inspections**

The following Radiograph Inspection documents shall accompany hardware delivered to Buyer. Documents shall be included inside of or securely attached to the outside of the shipping container.

1. All Radiographic film, this includes film from Grind Outs, Repairs, In Process and Final inspection.
2. Radiographic Technique sheets of all radiographic inspections performed.
3. Radiographic Reports of inspection (certification).
4. Radiographic film, Reports and Technique Sheets MUST be included in the box or package, with the details or assemblies when shipped to Buyer.

**(These requirements do not apply to electronic components manufactured per MIL-Standards, if components are obtained from Qualified Product List (QPL) sources).**

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### **DOCUMENT CONTENT REQUIREMENTS:**

#### **Certificate of Conformance (C of C) Content Requirements:**

The following content is in addition to the C of C content required by the Quality Management System Requirements:

1. Specification and revision that define accept/reject criteria.
2. Type of NDT inspection performed (i.e. penetrant Type IVc, Ultrasonic Class A etc.).
3. Inspectors Identification (Name or Stamp Number) and Level of certification
4. NDT Technique number and revision.
5. Evidence of Pratt and Whitney Canoga Park certified Source Inspection (if applicable).
6. Evidence of Government Source Inspection (if applicable).
7. Traceability to hardware inspected (i.e. serial numbers, lot numbers, etc.).

NOTE: If more than one NDT inspection is performed or multiples of the same inspection is performed, then the date of inspection, specification and revision number shall be included on the C of C for each inspection performed.

#### **Certifications/Test Reports:**

The Certification or Test Reports shall contain the following information (as a minimum):

1. Company Name and Address.
2. Date of Inspection.
3. Processing specification including revision and specification and revision that defines accept/reject criteria.
4. Type of NDT inspection performed (i.e. penetrant Type IVc, Ultrasonic Class A etc.)
5. Inspectors Identification (Name or Stamp Number) and Level of certification. Radiographic report(s) must be signed by the inspector.
6. NDT Technique number and revision.
7. Evidence of Pratt and Whitney Canoga Park Source Inspection (if applicable).
8. Evidence of Government Source Inspection (if applicable).
9. Traceability to hardware inspected (i.e. part number, FR number, serial numbers, lot numbers, etc). (If applicable)
10. Traceability to material inspected (i.e. bar stock, tubing, etc.) includes specification number and revision, heat lot number, number of pieces, and size of each piece. (if applicable).
11. Inspection results, accept and reject quantities.
12. Reference to previous NDT certifications or reports for repair/rework (if applicable).
13. Reference to attached recordings (i.e. film, photographs, C-Scans, etc.).
14. Unique Certification/Report number.
15. Primary supplier's purchase order number (if applicable).

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### **NDT Technique Sheets:**

Technique sheets shall contain the following information (as a minimum) for all NDT methods except radiography. Radiography technique(s) shall follow requirements specified in the radiographic specification.

- 1) Suppliers Name and Location.
- 2) NDT Method.
- 3) Technique number, revision and date.
- 4) Hardware identification: All applicable information below.
  - a) Engineering drawing/part number and revision.
  - b) Material descriptions: For Raw material provide dimensions.
- 5) Processing specification and revision.
- 6) Specification number and revision for Accept/reject criteria.
- 7) Acceptance criteria.
- 8) Customer Name.
- 9) Inspection method used (i.e. Type IVb, Type IVc, Type IIa, immersion, C-Scan, contact, head or coil etc.).
- 10) Penetrant materials (brand names) if applicable.
- 11) Penetrant processing parameters (i.e. dwell times, drying, etc) if applicable.
- 12) Pre-penetrant etch, pre-cleaning and post cleaning (if applicable).
- 13) Scan Plan (if applicable).
- 14) Equipment used (i.e. transducer information, instrument, borescope, etc.).
- 15) Level III name and signature.

### **Definitions:**

Certification of Conformance (C of C): Document declaring all applicable Purchase Contract and process/material specification requirements have been complied with.

Certification/Report: Document displaying evidence that specific inspections were performed and all applicable requirements have been met.

NDT Techniques: A part and feature specific processing procedure that describes how an NDT operation is to be accomplished.

Primary Supplier: The supplier awarded a Purchase Contract by Pratt and Whitney for the hardware.

Sub-Tier Supplier: A supplier under contract with and performing work for a Primary Supplier.

Procured Product Acceptance Requirements (PPAR): Quality requirement and [inspections included](#) with the Purchase Contract.