



09492S00014
Revision B

GENERAL ATOMICS ELECTROMAGNETIC SYSTEMS

NON-DESTRUCTIVE EXAMINATION REQUIREMENTS SPECIFICATION

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REVISION HISTORY

Revision	Date	Description of Change
A	2021/09/02	Initial Release; ECN-103006
B	2023/06/30	ECN-11238: Complete re-write, Ref. SCAR 2023-018.

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ACRONYMS

Acronym	Definition
AWS	American Welding Society
CDM	Configuration and Data Management
CWI	Certified Welding Inspector
Doc.	Document
DoD	Department of Defense
DOE	Department of Energy
ECN	Engineering Change Notice
ET	Electromagnetic Testing
GA	General Atomics
GA-EMS	General Atomics Electromagnetic Systems
LT	Leak Testing
MT	Magnetic Particle Testing
NASA	National Aeronautics and Space Administration
NAVSEA	Naval Sea Systems Command
NDE	Non-Destructive Examination
PT	Penetrant Testing
QC	Quality Clause
RT	Radiographic Testing
SCAR	Supplier Corrective Action Request
UT	Ultrasonic Testing
VT	Visual Testing

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1 INTRODUCTION

This specification defines the Non-Destructive Examination (NDE) requirements for General Atomics Electromagnetic Systems (GA-EMS) Suppliers performing NDE on Department of Defense (DoD) products. When assigned, this specification is also applicable to other GA-EMS contracts, i.e., Department of Energy (DOE), NAP, National Aeronautics and Space Administration (NASA), etc. The requirements specified in this document shall be met when GA-EMS Standard Quality Clause (QC) 280 is specified within GA-EMS purchasing documents.

2 APPLICABLE/REFERENCE DOCUMENTS

Table 1 and Table 2 list the applicable/reference material for this document. For the latest revisions, see the GA-EMS Windchill online library.

Table 1. GA-EMS Documents

Doc. Number	Doc. Title
09492L00008	GA-EMS Standard Quality Clauses
EMS-0364	Supplier Document Reuse Request
49200P00002	Deliverable Documentation/Data Item Submittal Instructions

Table 2. Non-GA-EMS Documents

Doc. Number	Doc. Title
SNT-TC-1A	Personnel Qualification and Certification in Nondestructive Testing Personnel
NAVSEA T9074-AS-GIB-010/271	NAVSEA Technical Publication, Requirements for Nondestructive Testing Methods
NAVSEA S9074-AR-GIB-010/278	Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels
AWS QC1	Specification for AWS Certification of Welding Inspectors
NAS 410	NAS Certification & Qualification of Nondestructive Test Personnel
ASME (BPVC) Section V	Nondestructive Examination

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3 GENERAL REQUIREMENTS

All NDE processes shall be performed and interpreted by qualified personnel certified in accordance with a written practice developed by Seller to meet the requirements of either SNT-TC-1A or NAS 410 per drawing or Order. The recommended practices of SNT-TC-1A are mandatory when invoked and shall be modified only when required by specifications. Seller's written practice must be approved by Seller's NDE Level III Examiner.

All NDE testing methods (e.g., Electromagnetic Testing [ET], Leak Testing [LT], Magnetic particle Testing [MT], Penetrant Testing [PT], Radiographic Testing [RT], Ultrasonic Testing [UT]) shall be performed in accordance with detailed written procedures meeting the requirements of the Order (e.g., Buyer-released drawings, specifications).

4 DOCUMENT SUBMITTAL

4.1 Sellers Written Practice

Seller is responsible for following Seller's written practice.

An exception is made for Visual Testing (VT) when all the following conditions are met:

- VT is performed in accordance with AWS QC1.
- Personnel performing VT are currently certified as a Senior Certified Weld Inspector or Certified Weld Inspector in accordance with AWS QC1.
- No other NDE inspections are required.

4.2 Personnel Certification Records

Seller is Responsible for ensuring personnel certification records are maintained and kept current during performance of the Order.

Seller shall submit certification records of personnel performing NDE inspections required by the Order for Buyer's approval prior to performance of NDE testing. Seller shall submit certification records to Buyer for individual inspectors separately.

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Personnel certification records shall include the following information:

- 1) The following requirements pertain to all NDE methods:
 - a) Certifications shall include a certifying statement stating the individual is certified in the NDE testing methods (e.g., MT, PT, UT, RT) and meets the requirements of the company's written practice (include document number).
 - b) Current eye exam with date and results.
 - c) Records shall be signed by the certifying authority with name and title printed.
- 2) Personnel certification requirements for VT of welds:
 - a) VT Level II – Certification to the Sellers approved written practice as a VT Level II is acceptable unless otherwise specified in the Order.
 - b) American Welding Society (AWS) Certified Welding Inspector (CWI) – An inspector with a current AWS CWI certification is qualified to perform VT inspections of all welds unless the Order requires VT Level II certification to Seller's written practice/SNT-TC-1A (e.g., NAVSEA S9074-AR-GIB-010/278).

4.3 Non-Destructive Examination Procedures

An NDE procedure is required for approval for each NDE method utilized. A blank report form must be included.

- 1) ET
- 2) LT
- 3) MT
- 4) PT
- 5) RT
- 6) UT
- 7) VT or Inspection of Welds (VT)
 - a) Only required when specified by the governing weld code or standard (e.g., NAVSEA S9074-AR-GIB-010/278).

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4.4 Technique Sheets

Unless otherwise noted, all NDE inspections shall be performed to a part-specific inspection method technique sheet for each part to be inspected. All technique sheets shall include the applicable acceptance criteria per drawing or Order.

- 1) A part-specific inspection method/technique sheet (e.g., LT, MT, PT, RT, UT) shall be submitted to Buyer for review and approval.
- 2) Technique sheets for VT are not required.
- 3) Technique sheets for UT shall include a scan plan.
- 4) Technique sheets for RT shall include a shooting sketch.

5 NDE REPORTS

Upon completion of the examination and prior to product shipment, Seller shall submit NDE reports for review and approval in accordance with 49200P00002 to Buyer.

NDE reports shall include the following requirements:

- 1) Company name or identifier
- 2) Part or drawing numbers, revision (including engineering change notices, if applicable), and part description
- 3) Item serial numbers, lot number, heat number, and other appropriate identification
- 4) NDE procedure number/designator and any applicable revision number, letter, or other reference
- 5) Approved part-specific inspection method technique sheet number, if applicable
- 6) Method used
- 7) Equipment and materials used
- 8) Acceptance criteria
- 9) Date of examination
- 10) Test results
- 11) Weld map or data sheet if used or both
- 12) Clearly printed or typed name, signature, and NDE certification level of the individual(s) performing and authenticating the test
- 13) Clearly printed or typed name, signature, and NDE certification level of the individual(s) interpreting the test results

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- 14) Verification of Buyer's acceptance when QC 214 or 214a (Source Inspection Hold Points) are specified by the Order
- 15) Verification of the Government representative's acceptance when QC 215 or 215b (Government Source Inspection) are specified by the Order
- 16) All pages shall be paginated

6 NDE REQUIREMENTS

1) Visual Inspection of Welds and Braze Joints

All welds/braze joints shall be visually inspected in accordance with the requirements of the Order and Seller's written procedures. Results shall be documented on a visual inspection report meeting the requirements outlined in Section 5 herein.

2) Low Halogen

When penetrant materials with low halogen content are required, the test report shall include the material manufacturer's lot/batch number used and a certification of chemical analysis showing the actual halogen content for the applicable lot/batch.

7 DOCUMENT REUSE REQUIREMENTS

In some instances, it may be permissible to reuse certain documentation previously approved by Buyer under a prior Order (e.g., NDE procedures). In such instances, Seller shall obtain prior written approval by Buyer before data reuse submission. Seller shall submit all requests for data reuse to GA-EMS Configuration and Data Management (CDM) with a copy to Buyer's Authorized Purchasing Representative specified in the Order. Seller shall use the most current version of Form EMS-0364 for all data reuse requests, which can be obtained from Buyer's Procurement website at <https://www.ga.com/procurement/quality-assurance-requirements>.



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