

# GENERAL DYNAMICS

Electric Boat

SQ/10-09  
March 4, 2010

Subject: Non-Destructive Testing-- Lessons Learned

Enclosures: (1) Table I, Listing and Description of Deficiencies  
(2) Distribution Charts Noted NDT Deficiencies

References: (a) Recommended Practice No. SNT-TC-1A  
(b) MIL-STD-271F, REQUIREMENTS FOR NONDESTRUCTIVE TESTING METHODS  
(c) T9074-AS-GIB-010/271, REQUIREMENTS FOR NONDESTRUCTIVE TESTING METHODS  
(d) Electric Boat Standard Clause 60-67, "Nondestructive Test Procedure Approval"  
(e) EB 2678/J, Quality Control Requirements For Procured Material

Dear Valued Supplier:

Electric Boat wants to use this Lessons Learned Letter to share the results of our Supplier Non-Destructive Testing (NDT) Audit program for year 2009. The intent is to present an opportunity for our suppliers to gain insight into the strengths and weaknesses of the NDT capabilities of our supplier base. This letter may be helpful in improving your NDT program and assisting in surviving a NDT audit.

#### Background:

Electric Boat's builds only one product and that is; Nuclear Submarines for the U.S. Navy. We build these submarines with the help of approximately 2,600 suppliers, roughly 10% of these supply equipment which requires NDT. The shipbuilding community recognizes NDT as a critical key in assuring the integrity of material and welds. Providing oversight of the NDT processes at this volume of suppliers is a continuing challenge. Electric Boat has maintained a dedicated audit team to provide oversight of NDT throughout our supplier base since 2005 and the annual results have been shared with our suppliers.

#### Result:

Performed 29 NDT Audits throughout our supplier base and we noted deficiencies at 13 suppliers. The overall audit acceptance rate was 95%. When deficiencies are noted the practice is for our auditor to issue a Supplier Corrective Action Report (SCAR). This form documents the deficiency(s), and requests that the supplier identify the root cause, the corrective action and the preventive action. Table I contains a listing of the deficiencies and we categorized the findings as follows;

- Procedure deficiencies or inadequacy: Total of 9 deficiencies.
- Inspector/Level III qualification: Total of 5 deficiencies.
- Inspector performance: Total of 22 deficiencies.
- Equipment: Total of 4 deficiencies.

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Note: A SCAR could list a number of deficiencies at a single supplier; and because of this, the number of deficiencies will exceed the number SCARs issued.

Summary:

The majority of the noted deficiencies are recurrent, detectable and preventable. Deficiencies noted with inspector performance can be attributed to inadequate training and non-comprehensive NDT examiner oversight programs (monitoring and re-inspection). The data also suggests a vulnerability with NDT programs administered by an itinerant Level III Test Examiner. The assurance that a supplier's NDT program is functioning and compliant is the responsibility of management. Adequate training, equipment and oversight are inherent to a compliant NDT program. Suppliers are requested to assess your NDT programs to ensure that deficiencies noted in this letter do not exist in your facility. Electric Boat conducted a Supplier Conference in November, 2009; an entire day was devoted to NDT. Invitations to this conference were targeted to suppliers with extensive NDT programs and requirements. The presentation was developed by Electric Boat Supplier Quality and representatives from Electric Boat NDT Engineering and Nuclear Quality Control attended and were available to answer questions and share, "war stories". NDT findings during the year indicated a degree of confusion and a perceived contradiction between the re-certification requirements contained in Ref. (a) and (c). Ref. (a) allows re-certification by showing evidence of continuing performance, but Ref. (c) requires re-certification by examination. The requirements of Ref. (c) prevail, since this is the top tier document in the order of hierarchy. The overall theme of the conference was the criticality of NDT. The presentation included mock PT and MT inspections audits and the audience was encouraged to participate. Based on the positive feedback, Electric Boat intends to continue these presentations in 2010.

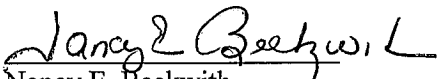
Positives Noted During Audits in 2010:

Robust internal audit program, all NDT inspectors audited.  
Inspector basics which include the inspector having the NDT procedure available and wearing eye glasses if required.  
Well organized and clean inspection areas.  
NDT procedures which clearly define acceptance criteria.  
Re-inspection programs, which include re-inspection of completed NDT.  
Continuing inspector training programs.

We encourage all of our suppliers to access and use our website for information. The NDT audit format that is used by our auditors is on this website and can be a useful tool for performing self-assessments.

When questions arise, remember that Electric Boat is a capable resource to help.

Very Truly Yours,

  
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# Distribution Charts – Noted Deficiencies

SQ/09-06  
Enclosure 2

