

KSL Procedures/Work Instructions



Blue Sheet Engineering Division

DCN:

This Blue Sheet applies to: <input checked="" type="checkbox"/> Individual Policy/Procedure Listed Below		
LANL review date: 12/8/08		
Policy/Procedure No: # KSL – UT – ASTM A-578-01 Ultrasonic Straight Beam Examination of Steel Plate - 16-30-009	Rev. No.: 0	Date: 5/17/06
Manual, Policy or Procedure Title: ASTM A578-01 Ultrasonic Straight Beam Examination of Steel Plate - 16-30-009		
Reason for Revision (if complete revision is checked above) Roll over of SSS contractor activities and work to LANL/LANS		
Documents listed above will be reviewed and conformed to by: All personnel qualified to perform Ultrasonic Examination of Steel Plate for acceptance of welding & related fabrications.		
Description of Change: 1.0 Purpose – No Changes 2.0 Scope – No Changes 3.0 Definitions – Modify “QC” – to read – Test & Inspection personnel qualified in accordance with Engineering Standards Manual (ESM), Chapter 13 – Welding & Joining, Volume 1, GWS 1-11 Attachment 3, Qualification and Certification of NDE Personnel. 4.0 Responsibilities – Delete “Quality Control Manager” responsibilities paragraph Modify “QC Inspector” title to UT Inspector Change “QC Inspector paragraph” to - It is the responsibility of the UT Inspector to inspect items to acceptance criteria specified by contract, specification, code, or work order. It is also the UT Inspector’s responsibility to identify, mark or document the welds that have been inspected and provide documentation of the inspection. Add - “UT Inspection personnel shall be qualified and certified in accordance with ESM, Chapter 13 – Welding & Joining, Volume 1, GWS 1-11 Attachment 3, Qualification and Certification of NDE Personnel. 5.0 Methodology – Delete - 5.1.1 Personnel shall be certified in accordance with KSL Procedure 16-30-001 6.0 Records – Modify to read		

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Recordable indications shall be reported as to length, width and location and recorded on LANL NDE Inspection Report Form. GWS 1-11 Attachment 4

Modify last paragraph to read - The original report shall be given to the customer with a copy placed in inspectors file for a period of 1 year unless instructed by the customer to retain copies longer.

7.0 References – Add –

ESM, Chapter 13 – Welding & Joining, Volume 1, GWS 1-11 Attachment 3, Qualification and Certification of NDE Personnel.

Implementation Support Document ISD 330-5.0 – Special Processes

8.0 Attachment – No Change

Date Revision Required: 12/1/10

Changes as marked

Reviewed by:

Kelly Bingham
LANL Welding Program Administrator

Date: 12-8-08

Approved by:

____ Signature on File ____ Date: 3/31/09 ____
ES - DE Group Leader

____ Signature on File ____ Date: 3/31/09 ____
ES - DE Division Leader

MSS Policy/Procedures Review Team please forward original Blue Sheet to Luci Chavez upon approval



**STRAIGHT-BEAM ULTRASONIC EXAMINATION OF STEEL PLATES
FOR SPECIAL APPLICATIONS (ASTM A 578-01)**

16-30-009

IMPLEMENTATION

Affected Personnel: QC INSPECTORS

Training Determination: Required Reading

Procedure Owner: Performance Assurance Division

Release Date: 05/17/2006	Next Revision Date: 05/17/2009
Procedure Type: Operational Procedure	Revision Number: 0
Procedure Level: Department	Effective Date: 05/17/2006

DOCUMENT MODIFICATION HISTORY

Rev No.	Description of Modification
0	New departmental procedure

KSL OPERATIONAL PROCEDURE STRAIGHT-BEAM ULTRASONIC EXAMINATION OF STEEL PLATES FOR SPECIAL APPLICATIONS (ASTM A 578-01)	Document No.: 16-30-009 Release Date: 05/17/2006
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DOCUMENT REVIEW AND APPROVAL

Function	Name	Position Title	Date	Signature
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Reviewed and Approved by	Thomas Bentley	ASNTL UT Level III	5/17/06	Signature On File
	Gerald Woodson	QC Manager	5/17/06	Signature On File
Final Approval by	Mike Goodwin	Performance Assurance Division Director	5/17/06	Signature On File

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1.0 PURPOSE

This procedure establishes the procedural steps needed for ultrasonic straight-beam examination of steel plates per ASTM A-578-2001 for detection and evaluation of laminar type defects.

2.0 SCOPE

This procedure covers the requirements and acceptance standards for straight-beam, pulse-echo, ultrasonic examination of rolled carbon and alloy steel plates, 3/8 in. in thickness and over with the supplemental requirements S1, S3, and S4 and the acceptance standard Level –C.

3.0 DEFINITIONS/ACRONYMS

ASNT – American Society for Non Destructive Testing

ASTM – American Standard for Testing and Materials

MHz – Megahertz – a unit of frequency equal to 1,000,000 cycles per second

PAD – Performance Assurance Division

QC – Quality Control Department within the Performance Assurance Division

UT – Ultrasonic Testing

4.0 RESPONSIBILITIES

QC MANAGER

Ensures only those personnel who meet the requirements of this procedure are permitted to perform inspection/activities covered by this procedure. Personnel performing inspections shall be qualified and certified in accordance with KSL QC Department Procedure 16-30-001, Nondestructive Examination (NDE) Personnel Qualification and Certification.

QC INSPECTOR

- Inspects items to acceptance criteria specified by contract, specification, code, or Work Order.
- Identifies, marks, or documents the items that have been inspected and provides documentation of the inspection. The Qualification of personnel for Ultrasonic Examination shall meet the requirements of KSL QC Procedure 16-30-001, Nondestructive Examination (NDE) Personnel Qualification and certification.

PERSONNEL CERTIFIED TO LEVEL I, II, OR III

May perform the examination described herein and record the results of that examination.

PERSONNEL CERTIFIED TO LEVEL II OR III

Shall supervise the examination when performed by a Level I, and shall evaluate the results of this examination.

PERSONNEL PERFORMING UT TESTING

Shall wear appropriate safety and protective equipment.

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5.0 METHODOLOGY

5.1 GENERAL INFORMATION

Personnel shall be certified in accordance with KSL Procedure 16-30-001

5.2 PROCEDURAL STEPS

5.2.1 Equipment

The equipment shall be as follows:

- The transducer shall be 1 or 1-1/8 inch in diameter or 1 inch square. A nominal test frequency of 2-1/4 MHz is recommended. When testing material less than 3/4 inch thick a frequency of 5 MHz may be required.
- The instrument shall be a pulsed-echo type. The amplitude linearity shall be checked in accordance with ASTM A-578-2001 Paragraph 4.1.

5.2.2 Examination

1. The examination shall be performed from either major surface of the plate.
 - a. The plate surface shall be sufficiently clean and free of scale to maintain a first back wall reflection of at least 50% of full screen height during scanning. Scale removal may be required to achieve the necessary reflection needed.
2. The test method shall be direct, immersion or liquid column coupling. Use a suitable couplant. (water, oil, etc.).
3. Scanning shall consist of 100% of the major surface of the plate.
4. Conduct the general scanning with the instrument adjusted to produce a 1st back wall reflection of 50 to 90% to full screen. Minor adjustments may be made for surface roughness.
5. To evaluate a discontinuity condition is found during general scanning, adjust the instrument such that the 1st back wall reflection produces a signal of $75 \pm 5\%$ full screen height in sound material. Maintain this setting during the evaluation of the discontinuity condition.

5.2.3 Recording Indications

1. Recording of Indications.
 - a. Record all discontinuities causing complete loss of back reflection.
 - b. For plates 3/4 inch thick and over, record all indications with amplitudes equal to or greater than 50% of the initial back reflection and accompanied by a 50% loss of back reflection.

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5.2.4 Acceptance Standards

1. Acceptance standard Level-C
 - a. Any area where one or more discontinuities produce a continuous total loss of back reflection accompanied by continuous indications on the same plane that cannot be encompassed within a 1-inch diameter circle is unacceptable.

6.0 RECORDS

1. The report shall include the following data:
 - a. All recordable indications listed in paragraph 5.2.3 on a sketch of the plate with sufficient data to relate the geometry and identity of the sketch to those of the plate.
 - b. Test parameters including: Make and model of instrument, test frequency, surface condition, transducer (type and frequency), and couplant
 - c. Date of Test
 - d. Operator and level of certification

7.0 REFERENCES

ASTM A578-2001

ASNT Standard SNT-TC-1A

8.0 ATTACHMENTS

None