



# GUIDANCE

## PRESSURE SYSTEMS SAFETY REGULATIONS 2000

Number: **NDTC 02**

Prepared by: **NDT COMMITTEE (TC5)**

Approved by: **CHIEF ENGINEERS' FORUM**

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Topic: **In-Service (post-commission) Non-Destructive Testing required by the Written Scheme of Examination (WSE) in compliance with the Pressure Systems Safety Regulations 2000.**

### **SITUATION:**

*When reporting the results of ultrasonic non-destructive testing of a shell boiler as detailed within the SAFed publication "Guidelines for the Examination of Endplate-to-Furnace and Shell Welded Boiler Joints (SBG1)" (Update to AOTC GN4), it is important that sufficient details are provided to enable an accurate assessment of boiler condition to be made. The purpose of this Guidance is to provide common reporting features that are to be used within SAFed member companies to enable reports to be produced that are beyond comment in the open market and that unambiguously meet the requirements of the SAFed publication "Guidelines for the Examination of Endplate-to-Furnace and Shell Welded Boiler Joints (SBG1)".*

### **GUIDANCE:**

Ultrasonic reports should include the following information:

- **Item Tested**

Boiler make & Serial No. Diameters of boiler. Date of manufacture of boiler. Date of test.

- **Test Requirement**

This should state that the main purpose of the examination is:-

- a. to detect cracking from the toe of the internal weld/weld root areas,
- b. to locate and size buried defects,
- c. verification of buried defects or incomplete penetration, (for subsequent inspections i.e. after initial inspection undertaken to the above requirements. Sizing required only where initial inspection showed defects greater than threshold limit.)

In accordance with SAFed publication “SBG1 - Guidelines for the Inspection of Endplate-to-Furnace and Shell Welded Boiler Joints”.

- **Procedure**

Refer to procedure and technique used.

- **Equipment**

Manufacturer, Type, Serial No.

- **Calibration Block**

Type, Serial No.

- **Operator Details**

Name and certification status including PCN No.

- **Couplant**

As used.

- **Probe Details**

Make, Serial No., type, angle and frequency.

- **Sensitivity**

Test sensitivity and evaluation/recording levels applied [DAC + XdB]:

- ◆ Method of correction employed to attenuation and transfer loss.
- ◆ Calibrated range should be quoted as part of sensitivity to provide repeatability of testing undertaken.

- **Scanning**

Highlight scanning area and probes used on joints examined.

- **Joints Examined**

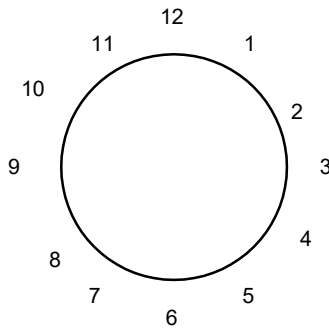
Details of the joints examined should be included by description or drawing along with the percentage inspection and any limitations.

- **Defect Location**

Sketches relating to the joint design should represent, as far as possible, the boiler design. Differences between single and double sided welds should be clearly shown in the sketches.

- a. **100% inspections**

All defects should be reported against a permanent datum, e.g. clock face.



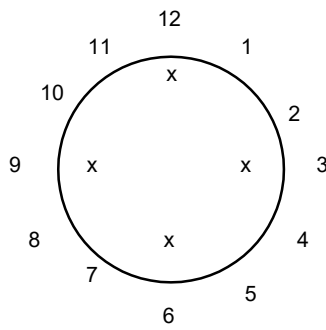
100% Inspection

The results obtained may either be placed in a tabulated form, by single typical values or by quoting a range. The single values and range values would be most appropriate to boilers having defects far below the requirements stipulated in SAFed publication “Guidelines for the Inspection of Endplate-to-Furnace and Shell Welded Boiler Joints”.

**b. Percentage inspections**

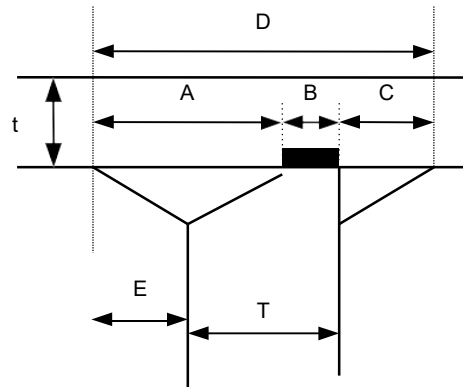
For percentage inspection both the location and size of areas examined should be included for future reference/repeatability.

e.g. shell joints:-



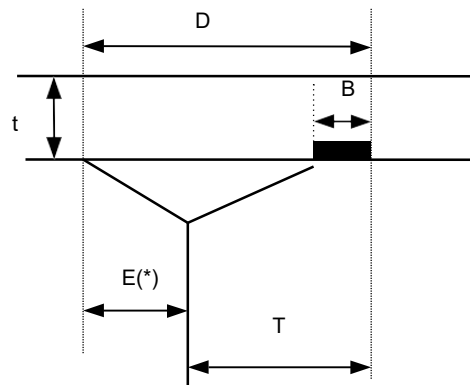
x = Areas Inspected

**c. Double Sided Welds**



Location	Length Examined	A	B	C	D	E
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	340	12	3	15	30	5
4	-					
5	-					
6	350					
7	-					
8	-					
9	380					
10	-					
11	420					
12	-					

**d. Single Sided Welds**



(\*) It must be noted that in order to confirm the degree of penetration on single sided welds access is required to physically record the ‘E’ dimension

Location	Length Examined	B	D	E
1	-	-	-	-
2	-	-	-	-
3	340	0	30	5
4	-			
5	-			
6	350			
7	-			
8	-			
9	380			
10	-			
11	420			
12	-			

**• Results**

- ◆ State the presence, or not, of any cracking or buried defects along with their relevant location and size Any such defects should be recorded against a permanent datum.
- ◆ Comment on parent material quality.
- ◆ Any limitation of test.