SAFED

SAFETY ASSESSMENT FEDERATION

Guidance

In-Service Inspection Procedures

Inspection of Wellman Robey Ygnette/Sygnette Boilers (2007 – 2016)

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CONTENTS

SITUATION 1
GUIDANCE 2
Visual Examination 3

SITUATION

Recent in-service NDT carried out on Wellman Robey Ygnette/Sygnette boilers, in accordance with SAFed guide SBG1 has revealed a pattern of major defects apparently associated with the original welding. They were detected at the first (five year) SBG1 and resulted in the scrapping of a number of boilers. The boilers are understood to be manufactured by Erensan in Turkey and placed on the UK market by Wellman Robey.

In order to investigate further one of the scrapped boilers was selected for destructive tests. The following macrographs indicate typical results of the investigation.

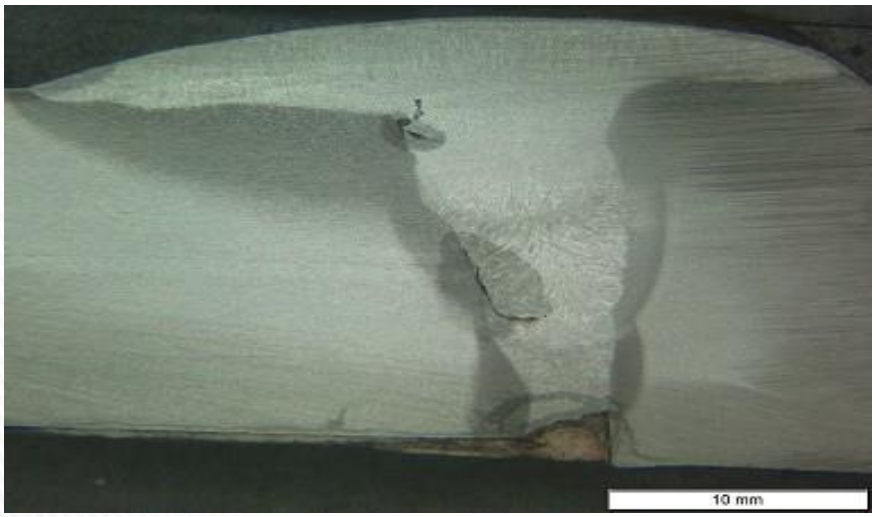

Figure 1 – Furnace Front

Defects: lack of sidewall and inter run fusion and lack of root penetration

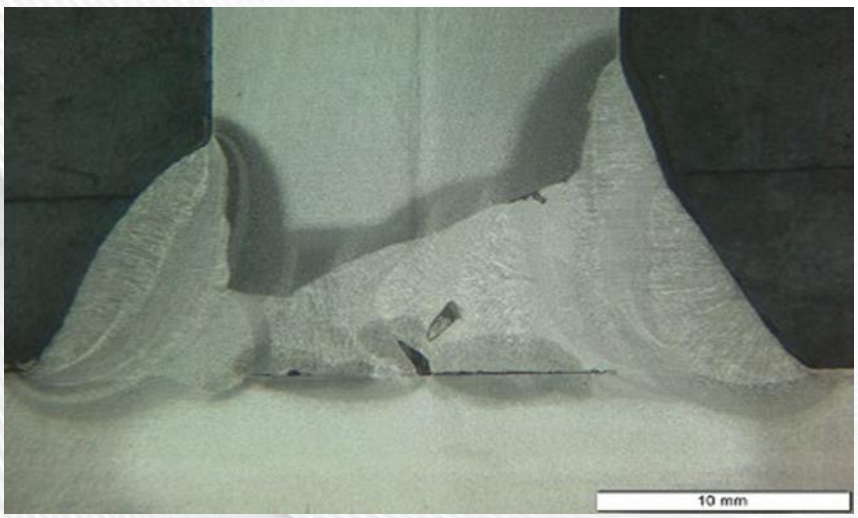

Figure 2 – Shell to tubesheet (front)

Defects: unfused land in two areas, lack of side wall fusion and inclusions

The investigation did not reveal any evidence of any of these defects initiating cracks after five years in service, for the particular boiler under investigation. However this does not provide any assurance that the defects will not start to develop cracks in the future. Certainly the presence of the defects will undoubtedly significantly increase the probability of cracking in the future.

GUIDANCE

Engineer Surveyors should make users aware that boilers supplied by Wellman Robey, of the Ygnette/Sygnette brand range between 2007 and 2016 may contain un-revealed manufacturing defects.

At the next out of service examination a supplementary NDT examination should be performed, based on SAFed SBG1/SBG2 examination. The extent of examination should be as follows:

Ultrasonic Inspection (see Figure 3)

A. Furnace to tubeplate – 100% UT shear wave scan from Tubeplate and furnace surface.

B. Furnace End plate – 100% UT scan from furnace end plate – shear wave only.

C. Rear Tubeplate to shell. – 100% UT scan from shell, shear wave and compression.

D. Longitudinal Seam - 100%

E. Front tube plate to shell – 100% UT shear wave scans from shell and tube plate where access permits (see note)

Note: Due to the door support ring (see Figure 4), the access for examination utilising compression wave scans from the front shell is restricted. If defects are found in any of the examined welds listed above it, will be necessary for removal of the door support ring to allow 100% compression wave scan.

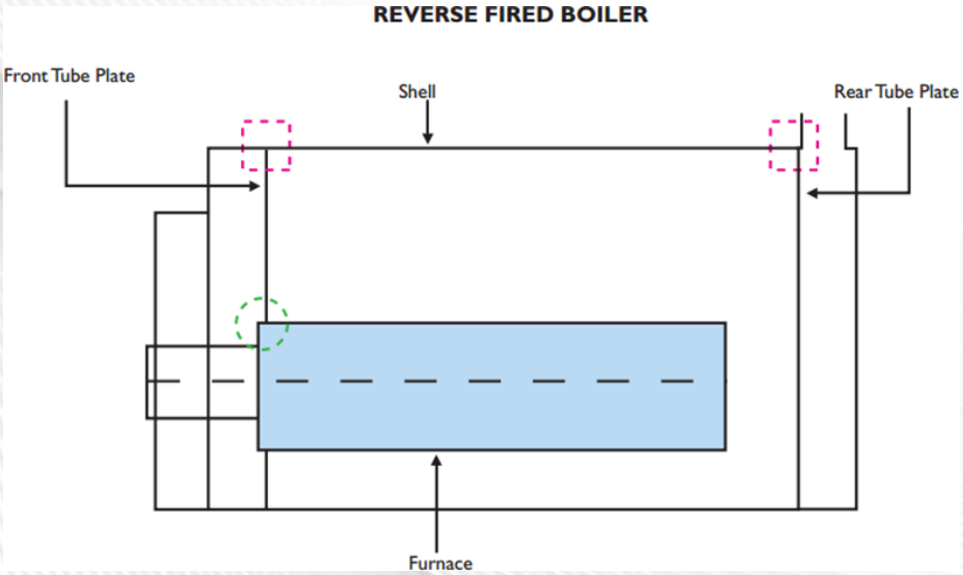

Figure 3 - Areas for ultrasonic examination

Figure 4 – Door support ring fully welded to shell

Visual Examination

A. All nozzle welds, internal & external. If there is any doubt about the level of penetration then UT can be called for.

B. All other welds on the boiler

If the results of the supplementary examination reveal defects which are unacceptable to SBG1/SBG2 or in the case of welds covered by the visual examination, unacceptable to the original build code, they should be individually assessed by the Competent Person for criticality. The outcome of this assessment will determine whether the weld will require immediate repair or be subjected to increased monitoring by suitable means e.g. NDT or visual examination as appropriate.

Where the supplementary examination has not revealed any unacceptable defects, the supplementary examination can be treated as the SBG1/SBG2 examination providing 20% of the front shell to tube plate weld has been examined in accordance with SBG1.