Cleaning & Inspection

Coal powered Power Plant (Malaysia)

- Heater Units

adam asia

SWIS
Sound Wave Inspection Systems

Job Overview

Adamasia, a SWIS exclusive partner, recently completed an inspection of four heater units at a coal fired power plant in Malaysia. The four units consisted of 9,114 U-tubes.

- Customer awarded Adamasia a contract to open, clean and inspect four heater units at the power plant.

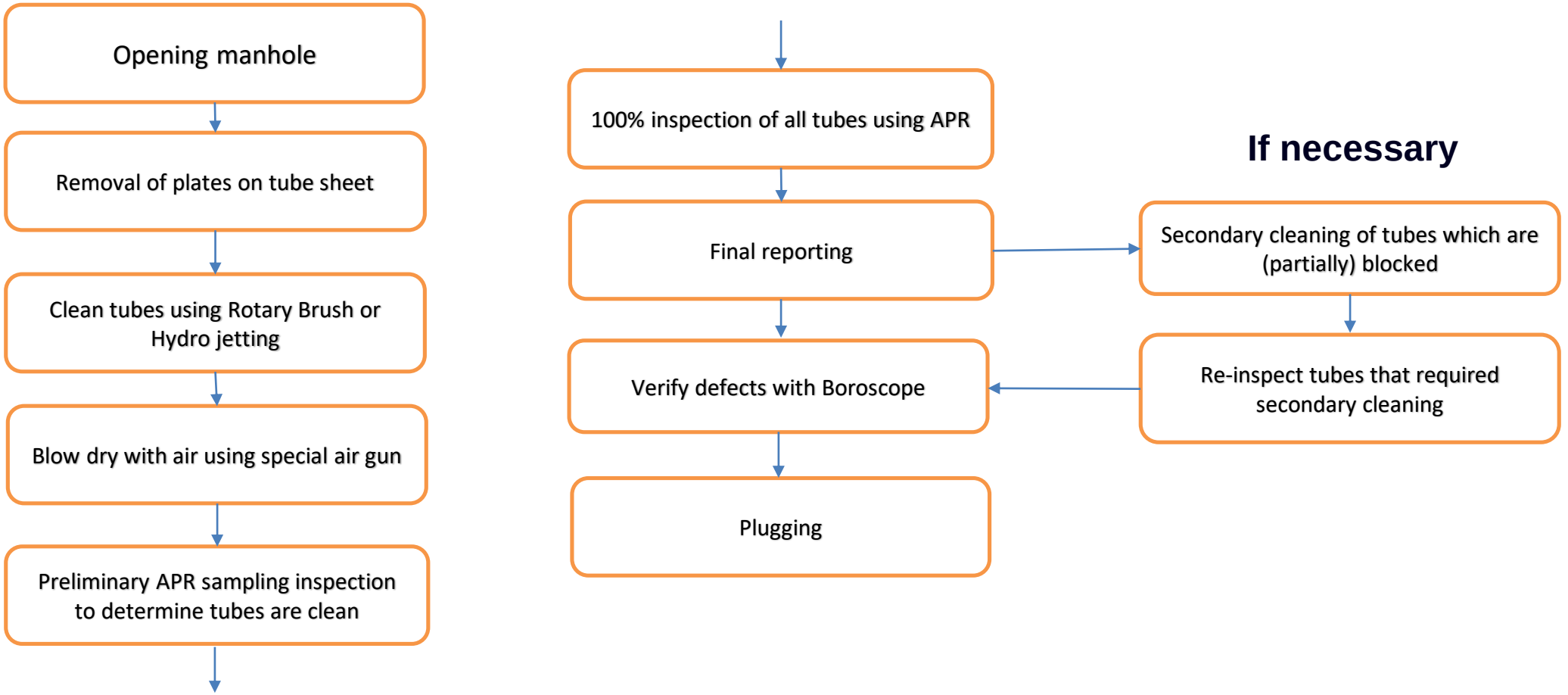
- The client chose Adamasia for the work due to their prior experience with APR, the capabilities of the Sonic V device, and the ability of this technology to easily detect flaws in U-tubes.

Cleaning method

Cleaning Heater units in coal fired power plants is particularly challenging because the tubes have a U-bend and contain thick residue that is difficult to get to. Since APR inspections require clean tubes for accurate analysis, Adamasia used a specialized cleaning technique, to effectively prepare the units for inspection.

To ensure the best possible results for their client, Adamasia established and followed a detailed cleaning and inspection process (next slide). The outcome was very effective and we recommend this procedure for all coal fired power plants.

Heater Cleaning and Inspection process



Summary Of Inspection Results

	Heater Unit 3	Heater Unit 5
Tube sizes	OD 19.05 mm x WT 1.5 mm	OD 15.88 mm x WT 1.8 mm
Material	ASTM A556M Gr.B2	JIS SGV480
Tube Length	23 m	17.42 m
# of Tubes	1,206 U-tubes (1,088 tubes tested)	2,692 U-tubes (2,621 tubes tested)
Defects Found	• Total Blockage: 534 • Wall Loss 20%-40%: 162 • Wall Loss 41%-60: 2	• Total Blockage: 247 • Wall Loss 20%-40%: 65 • Wall Loss 41%-60: 1

Summary Of Inspection Results

	Heater Unit 6	Heater Unit 7
Tube sizes	OD 15.88 mm x WT 1.8 mm	OD 15.88 mm x WT 1.8 mm
Material	ASTM A556M Gr.B2	ASTM A556M Gr.B2
Tube Length	20 m	17.42 m
# of Tubes	2,608 U-tubes (2,561 tubes tested)	2,608 U-tubes (2,600 tubes tested)
Defects Found	• Total Blockage: 776 • Wall Loss 20%-40%: 615 • Wall Loss 41%-60: 10	• Total Blockage: 0 • Wall Loss 20%-40%: 389 • Wall Loss 41%-60: 15

Verification with Boroscope

HP 6 Heater – 45% wall loss

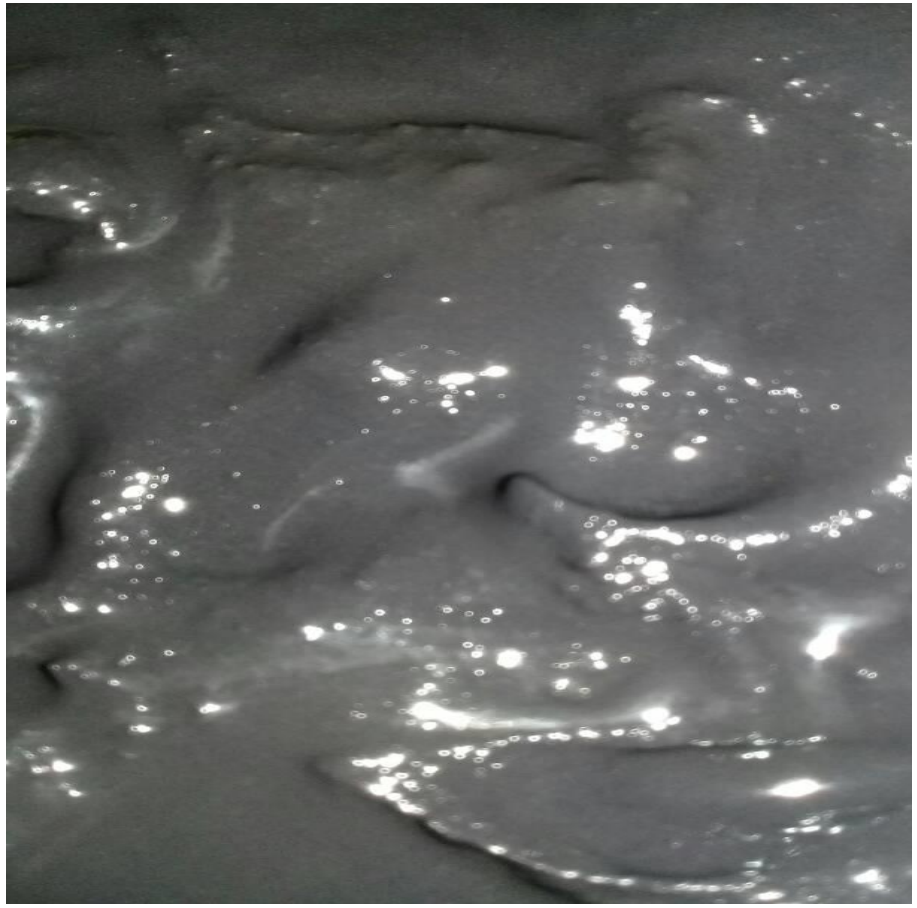
HP 6 Heater – 45% wall loss

HP 5 Heater – 50% wall loss

Outcome

- Adamasia carefully and thoroughly cleaned every tube prior to inspection with the Sonic V.
- Every defect in post inspection report was verified with a Boroscope and located at the precise location detected by APR.
- Accuracy in APR testing requires clean tubes and careful analysis. The Sonic V proved to be extremely accurate in great part because of the effective cleaning techniques that Adamasia used.
- Following report review, the plant owner decided to plug every tube with inner diameter wall loss greater than 40%.
- With inspection speeds of 250 tubes an hour, the Sonic V proved to be significantly faster than other techniques despite U-bend tubes that are 23 meters long.
- Following Adamasia's report on the heater units, plant ownership requested that the Sonic V be used on all future inspections.
- Adamasia now recommends that clients combine Sonic V testing with the cleaning technique they utilized during this inspection for all simialir equipment and applications.

Pictures



(Image of Sludge Removed from Heater Unit 5 & 6)

(Image of Black Thick Sludge Removed from Heater Unit 7)

Pictures

(Sonic V)

(Tube sheet after cleaning)

Case Study presented by

Marc Felius
Regional Manager Asia Pacific
Sound Wave Inspection Systems

Lakenblekerstraat 49
1431 GE Aalsmeer
The Netherlands
Tel : +31.20.2600126
Mobile: +31.6.27841324

www.swis.ltd

Sudesh Vasudavan
CEO
Adamaasia Worldwide (M) Sdn. Bhd

E 1-8 Kuchai Business Park
Jalan 1/127 off Jalan Kuchai Lama
58200 Kuala Lumpur
Tel : 03-79836087
Fax : 03-79836089