

## SOLUTION TO PROBLEM OF HEAT EXCHANGER TUBE BUNDLE INSPECTION

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### INTRODUCTION

The heat exchanger is a critical equipment in process manufacturing.

Maintaining and cleaning them makes a great difference in thermal and mechanical performance and energy efficiency. Well maintained and clean heat exchangers result in enormous energy savings.

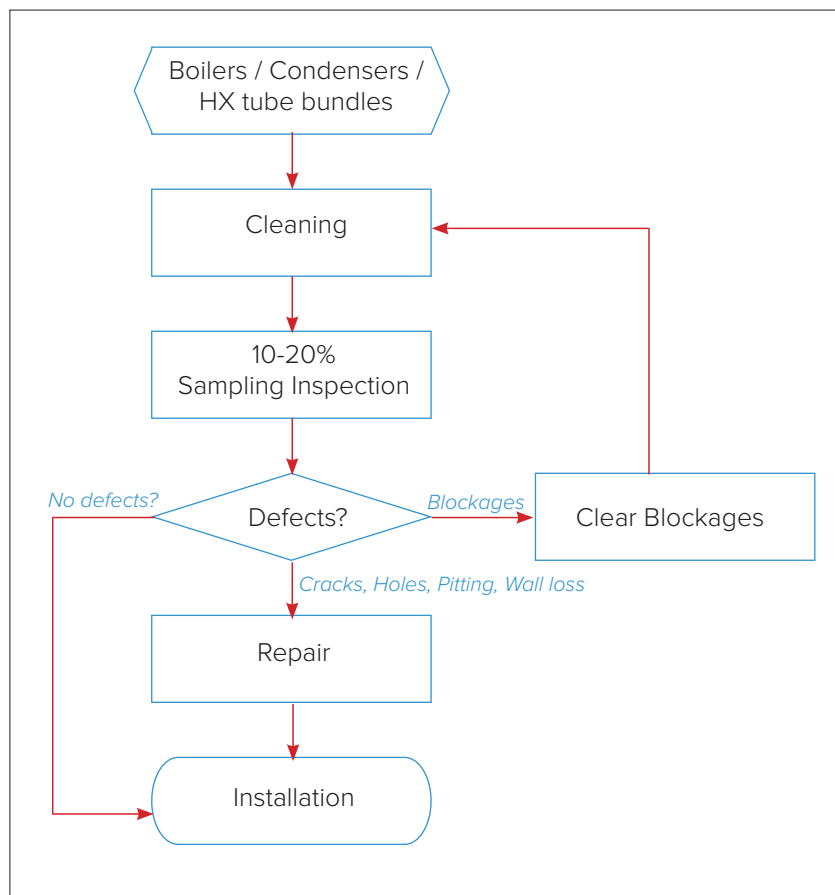


Figure 1: Workflow of tube bundle maintenance

### THE PROBLEM

Figure 1 shows the workflow of tube bundle maintenance. After completion of cleaning, the inspection team usually have only a few days to carry out the tube inspection. As there is no report or record of the tube cleanliness after cleaning, there are occasions that inspection team would request the cleaning company to reclean the tubes.

**THE SOLUTION**

Acoustic Pulse Reflectometry Inspection System (APRIS) can identify holes and blockages in a tube of regardless of tube configuration and material. It is quick, as it takes only 10 seconds per tube for measurement and can give the location and size of the defects.

team will have a report with data on all the tubes. From the report, the inspection team can select tubes with defects for the 10% sampling check. The APRIS in combination with other NDT methods can reduce the risk of emergency shut down.

By applying APRIS to perform a quick screening on all the tubes in the tube bundle after cleaning and blow drying as shown in Figure 2, the inspection

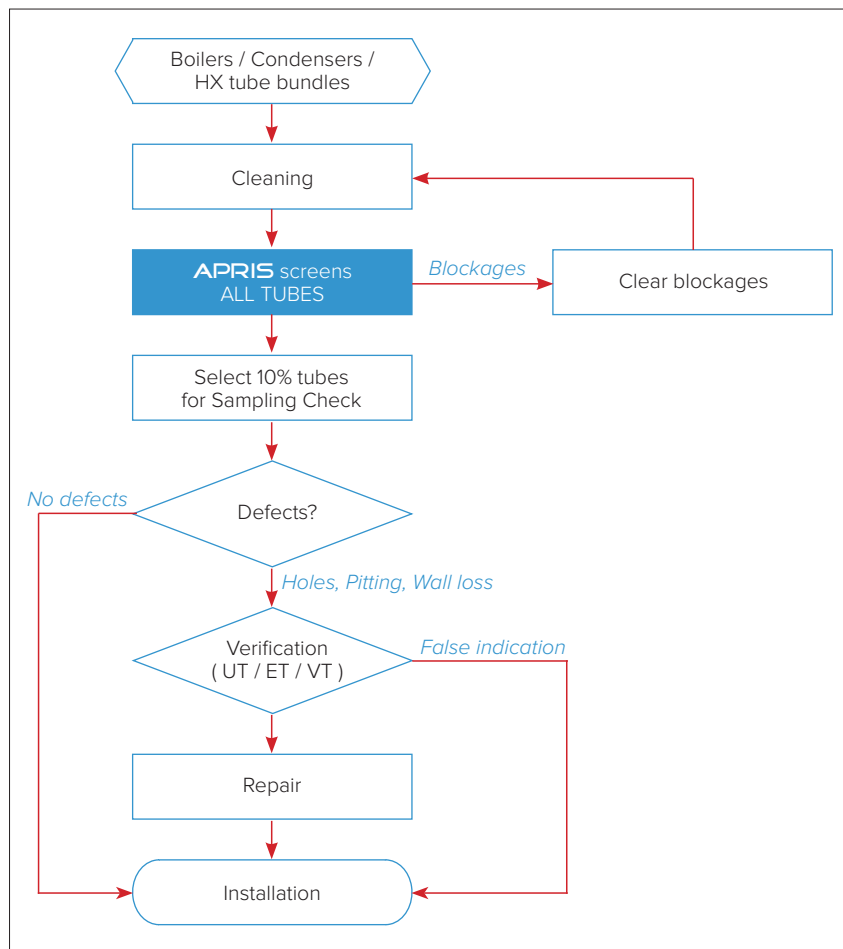


Figure 2: Application of APRIS after cleaning of tube bundle.

**CONCLUSION**

APRIS is a solution which provides quantitative and qualitative result in a short time frame.

APRIS has the following benefits:

1. Speed of measurement: 10 second per tube is fast and able to screen all tubes in a short time.
2. Precise location and measurement: The APRIS software give the location and size of the defects.