

Course Fee: US\$650

Design decisions can have a costly impact on heat exchanger operation. In this course, you learn by reviewing several real cases in which unit designs had critical commercial consequences for operators/ owners. Among other topics, this course may address

- assessment of acoustic vibration in rectangular ducted bundles (*Xace*[®])
- vibration analysis of a shell-and-tube heat exchanger (*Xist*[®] and *Xvib*[®]), including a review of the velocity scaling applied to tubes near impingement plate edges
- sizing of annular distributor (vapor belt) and associated tube vibration analysis (*Xist* and *Xvib*)
- root cause analysis of tube failures in a steam generator (a reboiler/steam drum configuration modeled as a thermosiphon reboiler in *Xist*)
- design review of an air-cooler/condenser (*Xace*) with excessive tubeside pressure drop during winter operation

In some cases, the units did not work in service; in others, the designs were revamped before the units began operation. Each case study is introduced as a problem; participants work individually or in groups to determine the cause and develop solutions. Prior to each case, the instructor reviews related HTRI methods.

Suggested Participants

Engineers—from novice to expert—who want to ensure that design problems are identified before operation

HTRI Software

This course will make use of the following HTRI software: *Xchanger Suite*[®] components *Xist*[®], *Xace*[®], and *Xvib*[®]. All training materials are based on the current software version.

Course Credits: 6 hours (PDH/CEU)

Outline

- I. Case 1: Steam generator with tube failure
- II. Case 2: Air-cooler with excessive pressure drop during winter operation
- III. Case 3: Shell erosion in an ethylene dichloride condenser
- IV. Case 4: Waste heat recovery unit with acoustic resonance