Alert
Proposal for Mandatory ASME Requirements for Tubular Heat Exchangers

Background
Shell-and-tube heat exchangers are used in great numbers in the pressure equipment industry. These range from sophisticated petrochemical to simple heating and air-conditioning units. Traditionally, the mechanical integrity of the pressure-carrying components of shell-and- tube heat exchangers is determined by the ASME Boiler and Pressure Vessel Code (typically ASME Section VIII Division 1) with the exception of the tubesheets and other related components, which are designed to the TEMA (Tubular Exchanger Manufacturers' Association) standard.

Since the early 1980's, ASME has been developing Non-mandatory Appendix AA in Section VIII Division 1 in stages, beginning with requirements for tubesheets in U-tube heat exchangers and more recently adding requirements for fixed tubesheet and floating tubesheet heat exchangers.

As Appendix AA is a non-mandatory appendix, heat exchangers have generally continued to have tubesheets and other associated components designed and constructed to the TEMA standards.

In addition to wide acceptance of the TEMA Standard by industry (both the users and the manufacturers), it must be noted that the TEMA Standards is adopted by regulation, forming part of Alberta's legislated pressure equipment requirements.

ASME Code Committee Proposal
The ASME is now proposing to introduce a Code revision incorporating the Appendix AA requirements into a new Part UHX of Section VIII Division 1, thereby making the currently non-mandatory requirements of Appendix AA mandatory.

This will result in the need for all shell-and-tube heat exchangers to be built to the ASME Code and to have to comply fully with all the provisions of the ASME Code for shell-and-tube heat exchangers.

The new Part UHX will likely be published as part of the 2003 ASME Section VIII Division 1addenda, making the requirements mandatory January 1, 2004. We understand that a white paper is being prepared by the ASME Code Committee to detail the differences between Part UHX and TEMA. Also, a Code Case is being developed to allow for an extension of one year for heat exchangers to be constructed to the TEMA Standard instead of Part UHX under the Code Case. We understand that ASME Code Committee members are meeting with TEMA to communicate the proposed Code changes to members of that association.

Implications
While in some cases, heat exchangers meeting TEMA requirements will also meet with requirements of the proposed Part UHX, in general this will not be the case. The following issues are of particular significance:
1. Design equations/analyses are different, and designers will need to perform design checks to different equations and parameters. This will need to be reviewed carefully by designers and manufacturers who are using computer programs for TEMA analyses at present since these programs will no longer be applicable.
2. Tube-to-tubesheet joint allowable loads/strength (UW-20 and Appendix A) will need to be considered.

Conclusions
As indicated above, the proposed Code changes may have significant implications with respect to

the design, construction and use of tubular heat exchangers. All tubular heat exchanger owners, users, designers and manufacturers are advised to monitor the proposed Code change and to take the necessary and appropriate actions.
They may wish to contact ASME directly for future developments on the proposed Code changes. When available, ABSA will post further information on this subject on ABSA's web-site: www.albertaboilers.com

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