24.RAI 208-8245, Question 03.08.03-4

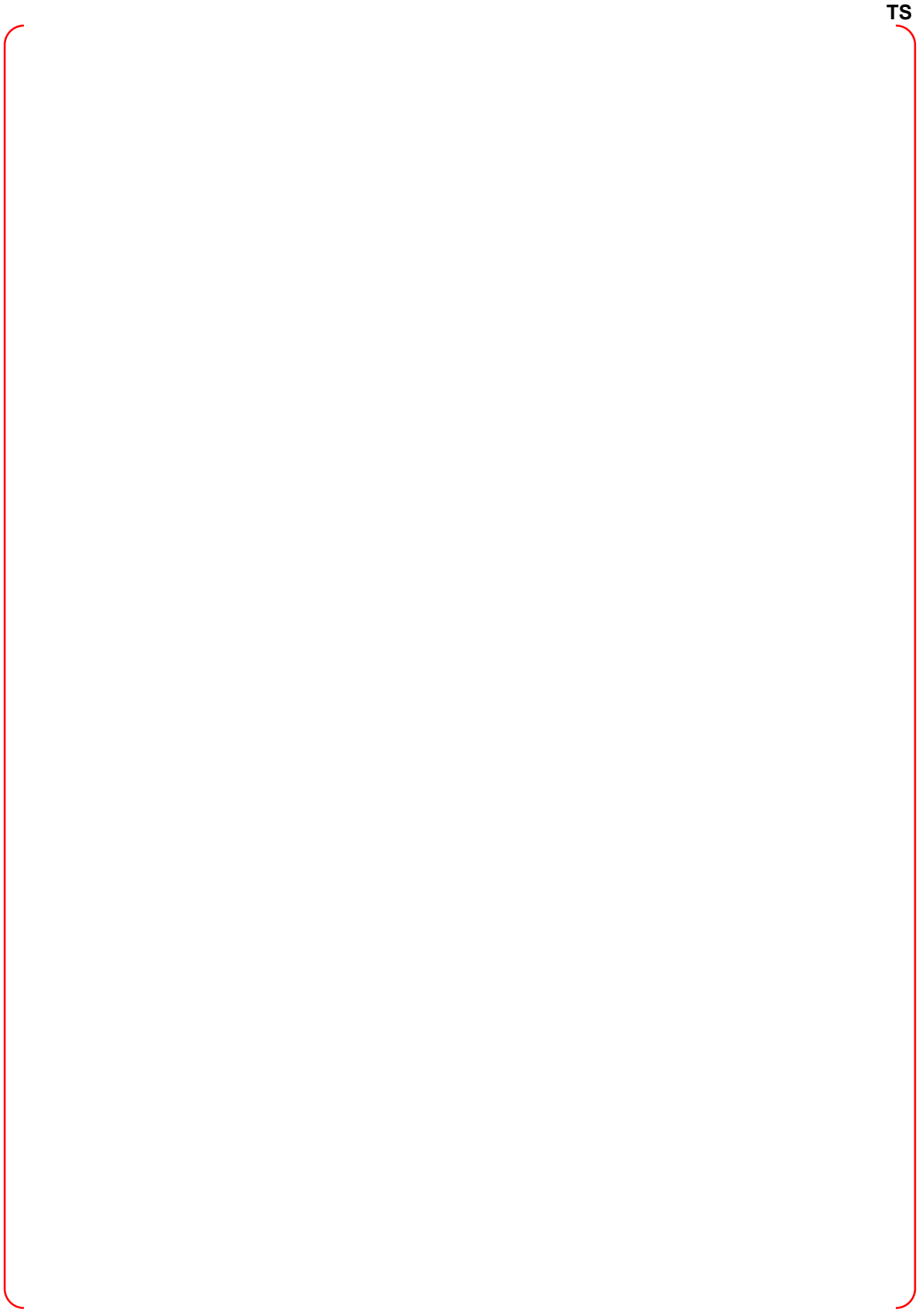
The staff reviewed the applicant response and noted that numerical values should be included in the above figure Figure 1, "Example of Temperature Profile," for at least the maximum and minimum temperatures inside and outside. Otherwise, it is not possible to judge which case is the worst case even if the slope of the left figure is greater than the slope of the right figure. In addition, the applicant is requested to explain what inside and outside mean, e.g., inside and outside of one of the containment internal structure wall. In which case, identify which wall and is this considered to be one of the worst cases. For the accident condition, the thermal gradient would vary over time; therefore, the applicant is requested to explain whether Figure 1 (b) represents the worst case throughout the thermal transient.

KHNP will submit a final RAI response which will address the staff's comments.

KHNP INPUT

The equivalent linear temperature profile of normal operating conditions represents the limiting temperature profile for all plant conditions. Therefore, normal operating thermal loads were considered for containment internal structure design instead of accident thermal loads. Figure 1, below, compares normal operating thermal loads and accident thermal loads.
According to ACI 349, the actual non-linear temperature distribution can be converted to an equivalent linear temperature distribution for use in design of concrete structures. In the containment internal structure, the equivalent linear temperature profile for normal operating conditions is more severe than those of the accident conditions since the temperature difference between the inside and the outside surface of the containment internal structure during accident conditions is negligibly small.
Figure 1 shows the example of differential temperatures for normal operating condition and accident condition at 1,000 sec which is the worst case among the accident conditions.
For the worst case of temperature analysis of internal structures, normal operating loads are considered to the selected wall located close to heat source.

TS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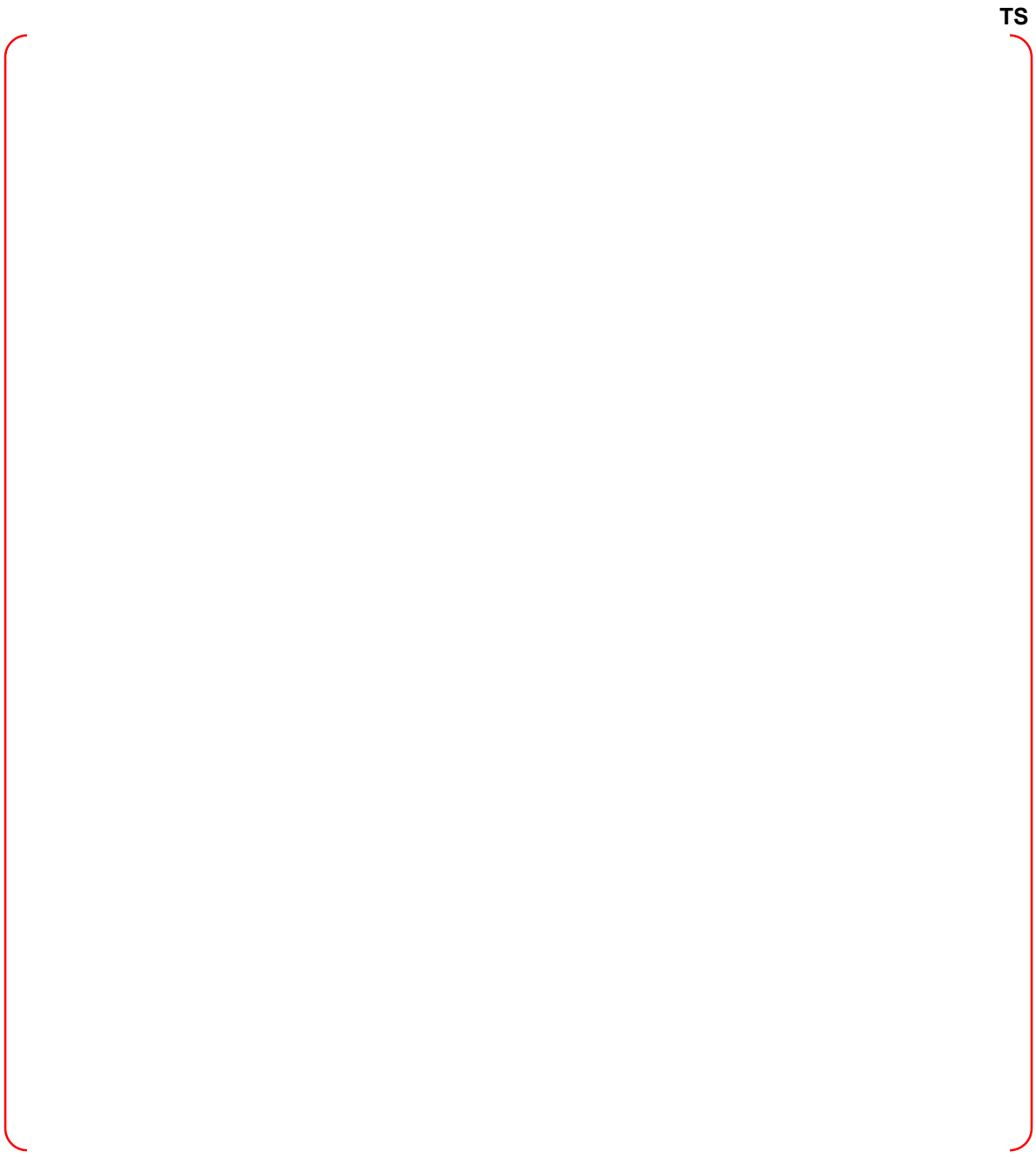
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