UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Professor T. V. Galambos
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Dear Professor Galambos:

This letter follows up our telephone conversation of May 21, 1985, regarding the interpretation and application of the combined stress equations in Section 1.6 "Combined Stresses" of the Specification contained in the AISC Manual of Steel Construction, 7th and 8th Editions.

The issues regarding these equations are as follows:

1. To which cross-sectional axes are these equations referred to, i.e., geometric axes or principal axes?

2. Should equations 1.6-1a of 1.6-2 be evaluated at various points on a cross-section?

3. On which bending moments should the maximum bending stresses be based, i.e, the moments occurring at a given cross-section or the maximum individual moments occurring anywhere along the number?

My position regarding these issues are as follows:

1. Equation 1.6-1a and 1.6-2 are referenced to the principal axes of a cross-section.

2. These equations are not evaluated at a given point on a cross-section. Rather, the maximum bending stress due to each principal moment acting separately is determined. Since there are two principal moments, the maximum stress due to these moments may occur at the same or different points on a cross-section. They will occur at the same point if the section is doubly-symmetric. They may occur at different points if the section is singly symmetric, such as equal angle or tee sections.

3. The principal moments from which the maximum bending stresses are determined do not necessarily have to occur at the same cross-section. That is, the largest principal bending moment about the major axis may occur at one section of the member while the largest principal bending moment about the minor axis may occur at a different section along the member.

4. The allowable stresses are determined from the behavior of the whole member in each principal direction separately. For example, for an equal

angle member the allowable stress for bending in the plane of the minor axis will depend on the length of the member, to account for possible lateral/ torsional instability. For bending in the plane of the major axis the allowable stress will depend only on the properties of the material.

I would appreciate your opinion regarding my position on these issues.

Sincerely,

Mark Hartzman

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