potential for interaction effects (pounding of the piping system) shall be considered using the amplified deflections obtained from the following equation:

$$\delta_x = \frac{C_d \delta_{xe}}{I_e} \qquad (15.5\text{-}1)$$

where

C_d = deflection amplification factor in Table 15.4-1
δ_{xe} = deflections determined using the prescribed seismic design forces of this standard
I_e = importance factor determined in accordance with Section 15.4.1.1

See Section 13.6.3 for the design of piping systems and their attachments. Friction resulting from gravity loads shall not be considered to provide resistance to seismic forces.

15.5.3 Steel Storage Racks

Steel storage racks supported at or below grade shall be designed in accordance with ANSI/RMI MH 16.1 and its force and displacement requirements, except as follows:

15.5.3.1

Modify Section 2.6.2 of ANSI/RMI MH 16.1 as follows:

2.6.2 Minimum Seismic Forces

The storage rack shall be designed…

Above-Grade Elevation: *Storage rack installed at elevations above grade shall be designed, fabricated, and installed in accordance with the following requirements:*

Storage racks shall meet the force and displacement requirements required of nonbuilding structures supported by other structures, including the force and displacement effects caused by amplifications of upper-story motions. In no case shall the value of V *be taken as less than the value of* F_p *determined in accordance with Section 13.3.1 of ASCE/SEI 7, where* R_p *is taken equal to* R, *and* a_p *is taken equal to 2.5.*

15.5.3.2

Modify Section 7.2.2 of ANSI/RMI MH 16.1 as follows:

7.2.2 Base Plate Design

Once the required bearing area has been determined from the allowable bearing stress F'_p *the minimum thickness of the base plate is determined by rational analysis or by appropriate test using a test load 1.5 times the ASD design load or the factored LRFD load. Design forces that include seismic loads for anchorage of steel storage racks to concrete or masonry shall be determined using load combinations with overstrength provided in Section 12.4.3.2 of ASCE/SEI 7. The overstrength factor shall be taken as 2.0.*

Anchorage of steel storage racks to concrete shall be in accordance with the requirements of Section 15.4.9 of ASCE/SEI 7. Upon request, information shall be given to the owner or the owner's agent on the location, size, and pressures under the column base plates of each type of upright frame in the installation. When rational analysis is used to determine base plate thickness and other applicable standards do not apply, the base plate shall be permitted to be designed for the following loading conditions, where applicable: (balance of section unchanged)

15.5.3.3

Modify Section 7.2.4 of ANSI/RMI MH 16.1 as follows:

7.2.4 Shims

Shims may be used under the base plate to maintain the plumbness of the storage rack. The shims shall be made of a material that meets or exceeds the design bearing strength (LRFD) or allowable bearing strength (ASD) of the floor. The shim size and location under the base plate shall be equal to or greater than the required base plate size and location.

~~*In no case shall the total thickness of any set of shims under a base plate exceed six times the diameter of the largest anchor bolt used in that base.*~~

Shims ~~*that are a total thickness of less than or equal to six times the anchor bolt diameter under bases with less than two anchor bolts*~~ *shall be interlocked or welded together in a fashion that is capable of transferring all the shear forces at the base.*

~~*Shims that are a total thickness of less than or equal to two times the anchor bolt diameter need not be interlocked or welded together.*~~

Bending in the anchor associated with shims or grout under the base plate shall be taken into account in the design of the anchor bolts.

15.5.3.4 Alternative

As an alternative to ANSI MH 16.1 as modified above, steel storage racks shall be permitted to be designed in accordance with the requirements of