

SAN ONOFRE NUCLEAR GENERATING STATION UNIT 1  
LONG TERM SERVICE PROGRAM  
REVIEW AND DEVELOPMENT OF SMALL BORE PIPING  
AND TUBING CRITERIA

Prepared for:

Southern California Edison

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11.2 Piping may be qualified by the strain criteria above, provided that the following constraints are observed:

- (1) In calculating the intensified primary stress  $\sigma_e$ , at least 50% of  $\sigma_e$  is due to earthquake loading.
- (2) In calculating moments due to earthquakes, a response spectrum method is used, with damping not exceeding that specified in Code Case N-411 (PVRC recommendations).
- (3) Diameter/wall thickness ratio ( $D_o/t$ ) does not exceed 50.
- (4) Materials are like SA106 Grades A, B, C or like SA312 Type 304. (No quenched and tempered ferritic steels or cold worked austenitic stainless steels.)
- (5) Joints are butt welded or girth fillet welded. (No threaded, seal-welded threaded, or bolted-flanged joints.)
- (6) Seismic anchor movements are adequately considered.
- (7) The cumulative usage factor due to MHE does not exceed  $1/4$ .
- (8) Option 1 ( $0.2 \frac{t}{R}$ ) and Option 2 (Markl's Correlation) is satisfied for stainless steel  $> 1\%$ .
- (9) 0.75 is never below 1.0.

