

AMERICAN ELECTRIC POWER SERVICE CORPORATION
DESIGN DIVISION
MECHANICAL DESIGN SECTION

Subject

Interim Acceptance Criteria for
Safety Related Piping Systems

Plant Applicability

Donald C. Cook Nuclear Plant
Units 1 & 2

Originator


Mech. Des. Cog. Engr.

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Date

Approval

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12.9.88.
Date



1.0 INTRODUCTION:

Donald C. Cook FSAR (hereinafter called FSAR, Ref. 4) defines design bases for various seismic category piping system. These bases provide sufficient safety margin for continued plant operation such that the plant safety is not compromised. However, during an evaluation of a specific plant condition, identified via a problem report, if the limits of the design bases for piping and its support systems are exceeded, operability of the piping system during a DBE will be assured by meeting the limits of these interim criteria (Note: Expeditious processing and reportability requirements are defined in AEPSC Procedure GP 15.1). These criteria will provide justifications for continued plant operation. Modifications required to return the piping and support system within the design bases limits shall be made by the next refueling outage or sooner.

2.0 SCOPE:

These criteria are applicable to all safety related piping and associated support systems of the Donald C. Cook Nuclear Plant.

3.0 CRITERIA:

3.1 Piping System Acceptance Criteria

An analysis of the affected piping system shall be performed in accordance with ASME Section III NC-3600 Service Level D limits (Equation 9) for loading condition associated with Design Basis Earthquake (DBE). Increased damping values as permitted by Code Case N-411 shall be used for DBE analysis.

$$S_p + S_w + S_D < 2.4 S_y \quad (\text{Ref. 1, Appendix F})$$

Where

S_p	= Longitudinal Pressure Stress
S_w	= Dead wt. stress plus stresses due to other Mechanical loads
S_D	= Design Basis Earthquake Stress
S_y	= Material Yield Stress at Design Temp.

NOTE: For pipe sizes 2.5 inches and larger, use an allowable stress of $2.0 S_y$ in the above equation.

3.2 Pipe Support Acceptance Criteria

3.2.1 In addition to the support loads developed in 3.1, thermal loads and other applicable displacement induced loads (e.g. seismic anchor movements) shall be included to define design loads for each component support associated with

the piping system. These supports will then be evaluated in accordance with the limits prescribed in Appendix F (Ref. 1) subsubarticle F-1370.

3.2.2 For anchor bolts, use a factor of safety of 2 against ultimate shear and tension values, instead of the values given in Structural Design Standard SDS-88 which has large factor of safety. For catalog items, prorate load capacities based on a factor of safety of 2.

3.2.3 Manufacture's one time load capacity shall be used for hydraulic snubbers.

4.0 CONCLUSION:

These criteria provide allowable values greater than the FSAR, however, these values are based on the current codes, standards and practices applicable to the design of Nuclear Power Plants.

5.0 REFERENCES:

1. American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Codes, Section III, 1983 edition.
2. ASME code case N-411 (Approval date February 20, 1986)
3. "Steel Construction Manual", American Institute of Steel Construction
4. Donald C. Cook Nuclear Plant, updated Final Safety Analysis Report (FSAR)