



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

3/25/79

✓ Bill Russell, DOR

the attached background information was handed to me by Bill Kennedy of Stone and Webster at the Beaver Valley meeting this afternoon. I believe you will want to place it in the PDR file on the stress code problem.

Roger Mattson

cc. Jim Knight  
Ed Case  
Vic Stello  
Ted Sullivan  
Mark Hartzman

## WOLK

Here's tabulation of various program methods. NUPIPE is a separate page since I was unsure as to whether it should be included at all

- Percentages following job names indicate the approximate usage based on amount of piping analyzed by computer (not total amount of seismic piping in plant.)
- SHOCK did not calculate off-axis responses (i.e. y and z response due to x earthquake) so intra-modal summation is not required.
- 2D vs 3D is separate page since tabulation is not by program, but by project
- memo attached shows design basis for piping on newer (NUPIPE) jobs.

NOTED

MAR 23 1979

D.F. STAYN

DFS

Attn: V. Stello

"... will"

Summation Criteria

Projects Used

Earthquake Direction

Modal Responses

Computer Code

(Intra-modal)

(Inter-modal)

Not Applicable

$$|R_{max}| + \sqrt{R^2 - R_{max}^2} \quad (\text{note 1})$$

MYankee (95%)  
Sunny (30%)

SHOCK

Summed equivalent static forces algebraically  
(X + Y + Z)

$$|R_{max}| + \sqrt{R^2 - R_{max}^2}$$

Beaver 1 (100%)  
Pasny (100%)  
Sunny (70%)  
MYankee (5%)

SHOCK2

$$(\sum R^2)^{\frac{1}{2}}$$

Summed modal responses (internal moments, displacements and support reactions by "modified SRSS")

SHOCK3

$$|(X^2 + Z^2)^{\frac{1}{2}}| + |Y|$$

Note 1: Descriptively, this is the largest modal force added absolutely to the SRSS of the remaining modal forces.

4/25/79  
WPK

# Summation Criteria

Computer Code

Projects

Intra-Model

Inter-Model

NUPIPE

ALL PRESENT  
DESIGN PROJECTS

Options:

- (1) Minimum  $|X| + |Y|$  or  $|Z| + |Y|$
- (2)  $(X^2 + Z^2)^{1/2} + |Y|$
- (3)  $(X^2 + Y^2 + Z^2)$

Options:

- (1) SPSS
- (2) "Grouping" per  
RG 1.92
- (3) "Double Sum" per  
RG 1.92
- (4) "Ten-percent" per  
RG 1.92
- (5) Absolute

4/19/79  
WJK

## Licensing Basis

<u>Project</u>	<u>Site</u>	<u>Piping Design</u>
Maine Yankee	2D	3D
Pasny	2D	3D
Surry	2D	3D
Beaver 1	2D	3D

← Not Licensing basis

3/26/79  
WJL

Scope Of Effort

	Computer Runs			SUPPORT POINTS
	SHOCK 1	SHOCK 2		
Sunny	40	40	~	350
B.V. 1		69		351
JAF		96		NOT AVAILABLE
MY	52	5		339

4 1/2" PIPE USING SIMPLIFIED METHODS -

Est. 4 1/2" Pipe 100 - 150 COMPUTER RUNS  
per unit

4-6 Support points per run



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