

DISTRIBUTION

~~Socket File~~
L:Rdg
L:AD/SS
L:SAB

NOV 13 1974

30
286

William P. Gammill, Chief, Site Analysis Branch, L
THRU: J. C. Stepp, Section Leader, Geology, Seismology, and
Foundation Engineering

PROBABILITY OF EQUALLING OR EXCEEDING 0.15g AT THE INDIAN POINT SITE

We have completed an evaluation of the probability that 0.15g will be equalled or exceeded at the Indian Point site. Our best estimate is of the order of 10^{-4} per year.

Seth M. Coplan, Seismologist
Geology and Seismology Section
Site Analysis Branch
Directorate of Licensing

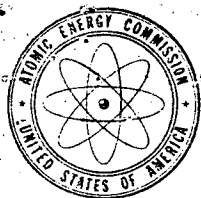
Renner B. Hofman, Seismologist
Geology and Seismology Section
Site Analysis Branch
Directorate of Licensing

Enclosure:
Indian Point Probability
Computation

MEMO
4

8111200323 741113
ADOCK 05000286

OFFICE	L:SAB	L:SAB	L:SAB		
SURNAME	SMCoplan:jab	RBHofman	JCStepp		
DATE	11/11/74	11/ /74	11/14/74		



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

NOV 13 1974

William P. Gammill, Chief, Site Analysis Branch, L
THRU: J. C. Stepp, Section Leader, Geology, Seismology, and
Foundation Engineering

PROBABILITY OF EQUALLING OR EXCEEDING 0.15g AT THE INDIAN POINT SITE

We have completed an evaluation of the probability that 0.15g will be equalled or exceeded at the Indian Point site. Our best estimate is of the order of 10^{-4} per year.

A handwritten signature in cursive script, reading "Seth M. Coplan".

Seth M. Coplan, Seismologist
Geology and Seismology Section
Site Analysis Branch
Directorate of Licensing

A handwritten signature in cursive script, reading "Renner B. Hofman".

Renner B. Hofman, Seismologist
Geology and Seismology Section
Site Analysis Branch
Directorate of Licensing

Enclosure:
Indian Point Probability
Computation

INDIAN POINT PROBABILITY COMPUTATION

0.15g Exceedence:

From Coulter, Waldron Devine (1973) 0.15g \rightarrow I = 7.3

From Brazee (1972) Epicentral area of I = 7.3 earthquake is
 $800 \text{ mi}^2 \approx 2100 \text{ km}^2$

1. From Isacks and Oliver (1964)

$$\begin{aligned}\log N &= 1.33 - 0.6I \text{ per year for a } 20,000 \text{ km}^2 \text{ area} \\ N_{7.3} &= 8.9 \times 10^{-4} / \text{year} - 20,000 \text{ km}^2 \\ \text{or } N'_{7.3} &= \frac{2100}{20,000} 8.9 \times 10^{-4} / \text{year at the site} \\ \text{or } P_{0.15g} &\approx 9 \times 10^{-5} / \text{year}\end{aligned}$$

2. From Davis (1974) data

$$\begin{aligned}\log N &= 2.5 - 0.71I \text{ per year for a } 20,000 \text{ km}^2 \text{ area} \\ \text{then } N'_{7.3} &= 2.2 \times 10^{-4} / \text{year at the site} \\ \text{and } P_{0.15g} &\approx 2 \times 10^{-4} / \text{year}\end{aligned}$$

3. From Davis (1974) Data Constrained to Isacks and Oliver (1964) slope

$$\begin{aligned}\log N &= 1.88 - 0.6I \\ N'_{7.3} &= 3.3 \times 10^{-4} / \text{year at the site} \\ \text{or } P_{0.15g} &\approx 3 \times 10^{-4} / \text{year at the site}\end{aligned}$$

4. For comparison Algermissen (1969) indicates that the mean number of occurrences of intensity VII earthquakes per century per 100,000 km^2 is 0.88 for the East Coast (region 9). Then

$$\begin{aligned}N_7 &= 0.88 \times \frac{1}{100 \text{ years}} \times \frac{20,000}{100,000} \\ N_7 &= 1.8 \times 10^{-3} / \text{year for a } 20,000 \text{ km}^2 \text{ area}\end{aligned}$$

and

$$N'_7 = 1.8 \times 10^{-4} / \text{year at the site}$$

so that

$$P_{I = VII} \approx 2 \times 10^{-4}$$

and the probability of equalling or exceeding
0.15g would be marginally less than 1.8×10^{-4}