

$$S_f = 80 \text{ ksi} \Rightarrow 9.58 \times 10^4 \text{ cycles} \quad (5)$$

$$90 \Rightarrow 3.67 \times 10^4 \text{ cycles} \quad (2)$$

$$100 \Rightarrow 1.55 \times 10^4 \text{ cycles} \quad (1)$$

fraction of life "used up" in one block:

$$\begin{aligned} \sum \frac{n_i}{N_i} &= \frac{5}{9.58 \times 10^4} + \frac{2}{3.67 \times 10^4} + \frac{1}{1.55 \times 10^4} \\ &= 0.0001712 \end{aligned}$$

How many blocks to failure?

$$\frac{1}{0.0001712} \approx 5800 \quad \text{N.B.}$$

$$\text{lifetime} = \frac{(5800)(20 \text{ seconds})}{(60)(60)} \approx \underline{\underline{32.5 \text{ hours.}}}$$