Two kinds of outputs (Point Estimate)

(i) For Performance objective to be

One limit state stringent
$$\left.\begin{array}{l} \text{CP @ MCE} \\ or \quad \text{LS @ MCE} \\ or \quad \cancel{\text{IO @ MCE}} \end{array}\right\}$$ OR? AND? $$\left\{\begin{array}{l} \text{LS @ DBE} \\ \downarrow \\ \text{IO @ DBE} \end{array}\right.$$

Two limit state stringy
$$\left.\begin{array}{l} \text{CP @ MCE} \\ \text{IO @ MCE} \end{array}\right\}$$ OR AND? $$\left\{\begin{array}{l} \text{LS @ DBE} \\ \text{yield @ DBE} \end{array}\right.$$
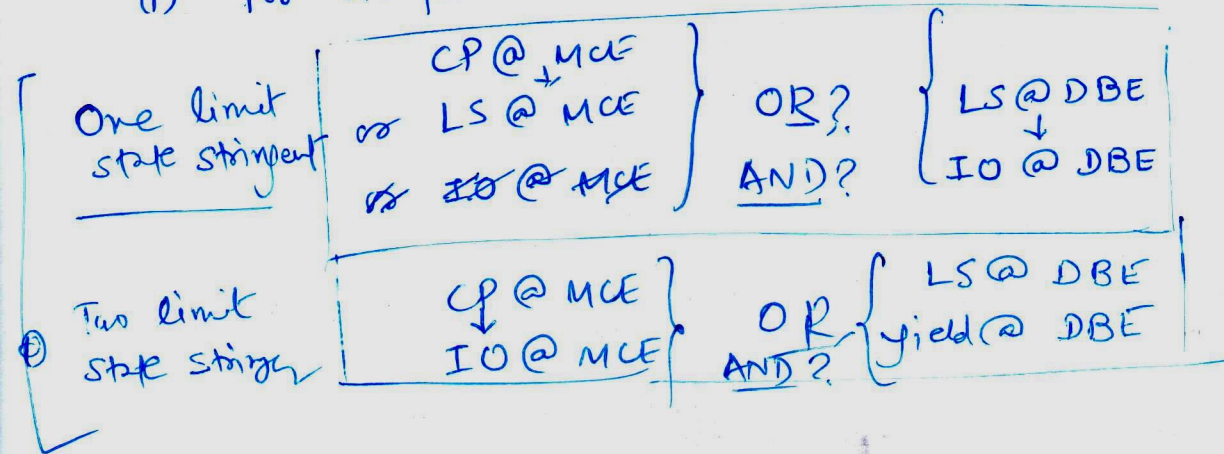
For Important or Very Important bldgs.

e.g. Category III   IV

→ Different approach   from   10% CP @ MCE
                                to 5% CP @ MCE
    ASCE 7-16   & 2.5% CP @ MCE

(ii) change in design for uniform risk, from uniform hazard.

RTGM & ratio of → DBE to MCE base shear   ~~S_DB~~

(iii) From (i) we can establish

$\mu_{CP, MCE}$

10% APOE of CP@MCE

10% POE of CP@DBE $\mu_{CP, DBE}$

$$\frac{\mu_{S_{a} DBE}}{\mu_{S_{a} MCE}}$$ ratio and check if

(1/2) is a reasonable number

Hazard-based ratio H_{475}/H_{2475} $\boxed{= 1/2}$
                                          III

& risk-based ratio $\cancel{RTGM}$
                      $RTGM_{CP, DBE}/RTGM_{CP, MCE}$

                      $\cancel{RTGM_{CP, \cancel{DBE}}}/RTGM_{CP, DBE}$
                      $\cancel{MCE}$

$$\boxed{H_{Tr} \propto \cancel{RTGM_{ds, Tr}}}$$ → design force