How to select a limited number of ground motion records and develop a design spectra is an important challenge for the structural dynamic analysis. Treating the UHS as the target spectrum for ground motion selection leads to a conservative bias in structural response assessment, especially in the high levels of hazard that is imperative for safety assessment of the important facilities since the design spectral shape plays an important role in the structural response. Therefore, a practical way for the reliable selection of ground motions is to considering the expected shape of records in the desired level of hazard. Since epsilon ($\varepsilon_{\text{Sa}}$) is an indicator of spectral shape, which has an important influence on the non-linear response of a structure, the selection of ground motion records based on the hazard related target $\varepsilon_{\text{Sa}}$ is a reasonable approach. In this paper, an alternative indicator of spectral shape is proposed, which results in a more design reliable spectra and better prediction of the non-linear response. This new parameter, named eta ($\eta$), is a linear combination of $\varepsilon_{\text{Sa}}$ and the peak ground velocity epsilon ($\varepsilon_{\text{PGV}}$). It is shown that $\eta$, as a non-linear response predictor, is remarkably more efficient than the well-known and convenient parameter $\varepsilon_{\text{Sa}}$. 