Design Question 4 -In the USA why new buildings seismic design and existing buildings seismic retrofit design use different code, FEMA 450 and ASCE41-13?

BESI' understanding:

(1)For new buildings design, use high standard for high ductility; for existing buildings retrofit design, use low standard for low ductility, because existing buildings were designed typically with low ductility, there is no way to have existing buildings to meet new buildings design code in retrofit design.

(2)Existing Building retrofit design is far more constrained than new building design. American new building seismic code uses seismic load based on ductility for strength design, uses MCE drift for drift control based on collapse prevention. American existing building retrofit code uses DBE seismic load based on ductility for strength design and drift control, use MCE seismic load based on ductility for performance based drift control. However, when special seismic resistance technologies(base isolation and energy dissipation using added devices) are used, both codes determine the seismic load based on equivalent damping ratio and equivalent stiffness.

For Existing Building Seismic Retrofit Design

Using performance based seismic design, method will reach a more economical solution compared to that of using new building seismic design code.