

National Earthquake Hazard Reduction Program
Advisory Committee on Earthquake Hazard Reduction
National Institute for Standards and Technology
November 19, 2012
Panel Discussion

ENGINEERING NEEDS FOR EXISTING BUILDINGS OBSERVED TECHNICAL NEEDS – PRACTITIONER PERSPECTIVE

Outline of Remarks by James Robert Harris, J. R. Harris & Company, Denver, Colorado

I'll begin with a statement of my perception of the objective: bring the inventory of buildings in a community up to standard of seismic resistance before the next significant earthquake. The focus of these remarks is on additional, or different, needs away from the West Coast. Much of this need relates to technical support for decisions that are essential policy issues.

The nature of the hazard is different; there are high hazard areas

- Middle Mississippi Valley, New Madrid Seismic Zone
- Wasatch Front (and north)
- South Carolina

There are also extensive areas of moderate and low ground shaking hazard, and of course in such areas there may not be much difference between East and West.

Among the hazard-related issues that need study are alternative concepts of hazard versus time, and how this relates to the replacement of existing hazardous buildings with new, and presumably less hazardous, buildings.

Another hazard-related issue is the lower attenuation of ground motion and consequent larger radius of damaging ground motion for a single event; it may be that fact actually drives a need for a better performance than the 10% collapse given occurrence of MCE ground motion.

There is another issue for the New Madrid region: multiple large earthquakes in an episode stretching over several months. This issue is not confined to existing buildings, but it could fundamentally alter our concepts of how to develop a resilient infrastructure.

The nature of the population of existing buildings is somewhat different:

- Big and dense cities - consequences of each need to be understood
- Older buildings
 - o some additional archaic materials and systems, (more variations of URM and of wood framing, cast iron, etc.)
 - o more degradation (the whiskers of age)

One topic not restricted to being away from the West Coast is that the characteristics of building inventory decay, replacement, and renewal need to be identified and quantified in a useful way to support decision making. For example, hospitals may have a much shorter mean life than multifamily residential, and thus (ironically) in low hazard areas a focus on rehabilitation of hospitals may be misplaced.

A few figures will be used to illustrate the remarks.