Structural Engineers Roundtable Discussion – Summary of Key Points

Participants

- Brian Meacham (BM), Moderator
- Robert Pekelnicky (RP), Degenkolb Engineers, PBD for earthquake, other hazards, resilience
- John Hooper (JHo), MKA, PB design seismic for tall buildings, some PBD for wind tall buildings
- Don Scott (DS), PCS, representing NCSEA, PI for SEI pre-standard on PBD for wind, chair of SEI resilience committee
- Terri McAllister (TM), NIST, PBD for fire, structural and wind, and community resilience
- Seth Thomas (ST), KPFF, PBD for seismic, tsunami and flood, some collapse
- Erica Fischer (EF), Oregon State University, PBD for seismic and fire engineering
- Jim Harris (JHa), JR Harris & Assoc., practicing SE, long history PBD for structure from NBS days
- Jennifer Goupil (JG), ASCE/SEI staff, ASCE 7, pre-standard for PBD for wind, PBD for fire
- Chris Schumaker (CM), Dept. of State, OBO, structural engineer, blast / protective design
- Jitender Singh (JS), NRC Canada, earthquake engineer, NRCC engaged in similar activity
- Richard Sullivan, Dept. of State

Key Take-aways

- Several areas of structural engineering have well-developed performance-based design approaches, such as seismic and wind, but not all, and not necessarily approached in same way.
- Need to develop common set of definitions – performance-based, performance requirement, performance-based design, performance criteria, etc…
- Would be nice to have hazard-neutral framework but may not be possible.
- Helpful to look back to Performance Concept (HUD, 1970) and Operation Breakthrough, as well as NKB structure in Europe.
- Difference in expectations from society and engineers - need to pull back curtain and work to develop common understanding and expectations.
- Sustainability and resilience (and durability, lifecycle) objectives need to be included.
- Starting with comprehensive set of whole building, qualitative performance statements / objectives, would be a good start. Ultimately, quantification is needed, but may differ between disciplines, and approaches may differ.
- Risk as a basis for performance is important but needs to be balanced with cost. Need to define what risks. Cost to society, not just cost to developer / owner, which can be different. (Low cost of initial construction could mean high lifecycle cost if building a poor performer.) Also need to consider reliability of functionality. (Might be called maintaining performance in use.)
- Should have metrics for minimum performance – and how to demonstrate that. Can consider 'stretch code' idea to go beyond minimums if client or jurisdiction wants to.
- Big opportunity if approach allows for more specific design guidance for specific needs, and less 'one size fits all' approach. Can result in better designs, better cost optimization, better performance.
- Society has expectations for sustainability and resilience – need to match expectations better. Also, can use performance code as means to show how SEs are taking into account in designs.
- Training, education, competency important, but not everyone needs to conduct PBDs.