Use of Simulated Motions to Increase Energy System Resilience

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Overall Goal: **To increase the seismic resiliency of California and beyond**

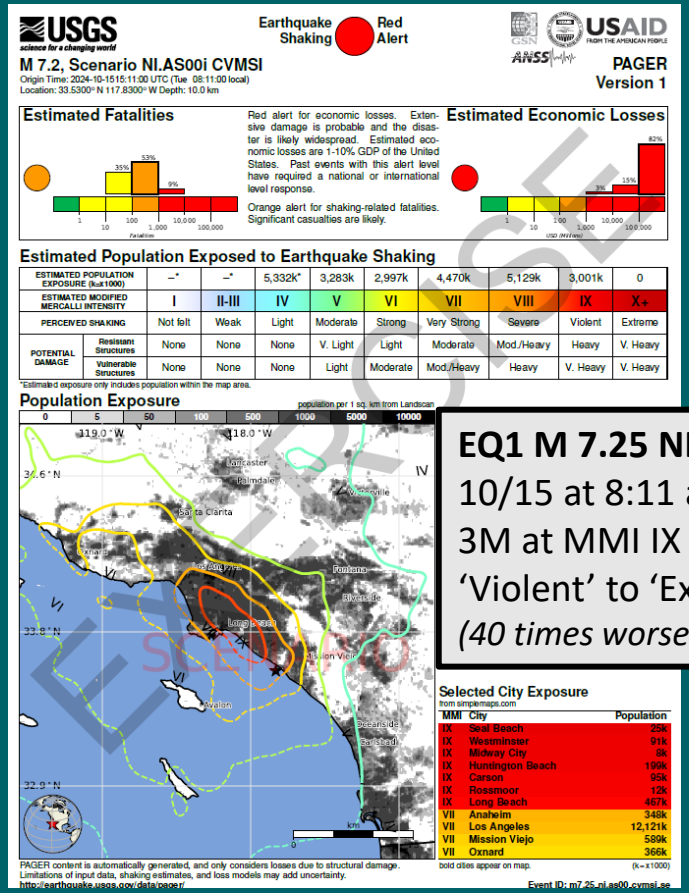
Questions for **Earthquake Scenario** / 'Exercise' Use Case:

In the event of a significant earthquake, SCE will need to answer accurately and promptly:

1. How many people and businesses are without power? (and in which areas)
2. When will their power be restored? (for this, we will need information on *interdependencies*)

Questions for **Investment Strategy** / 'Retrofit Prioritization' Use Case:

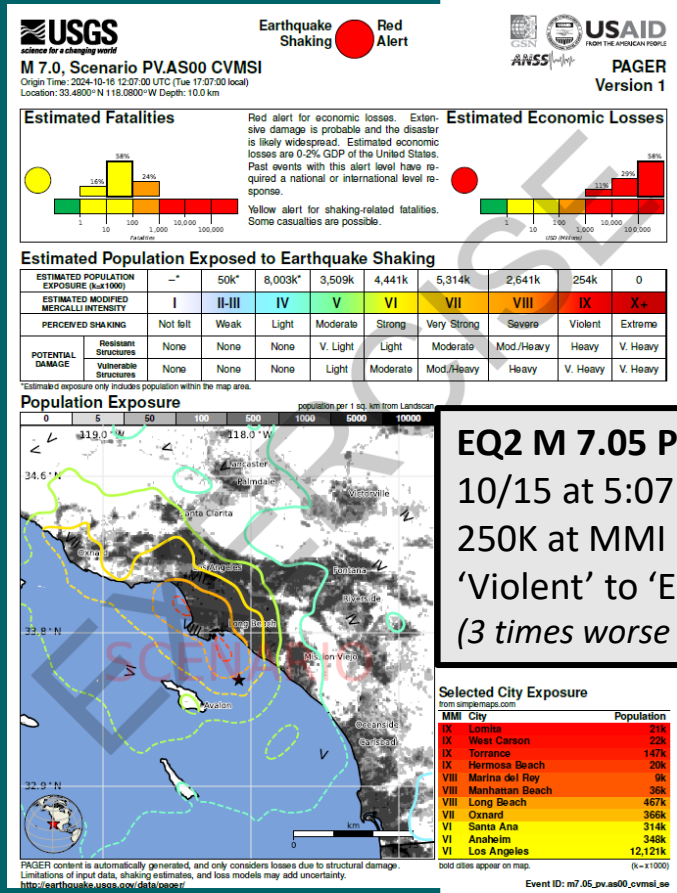
1. What are the best available *sites* for future investment during future grid build-out?
2. Which existing critical facilities may be under-designed (need to guide / prioritize mitigations)?



"Doublet" similar to Turkey 2023 and Ridgecrest 2019 sequences

Direct hit on Urban Los Angeles and Port Complex

EQ1 M 7.25 NIF
10/15 at 8:11 a.m.
3M at MMI IX or X
'Violent' to 'Extreme'
(40 times worse than NR'94)



EQ2 M 7.05 PVF
10/15 at 5:07 p.m.
250K at MMI IX or X
'Violent' to 'Extreme'
(3 times worse than NR'94)

RG XI
SCE FSE

EXERCISE SCENARIO

Strategy of SCE's Seismic Resiliency Program

Mission: To provide seismic *safety* and *reliability* for SCE personnel and the public, and business continuity for critical operations.

1) Intersections; risk is concentrated where fault line & lifelines intersect

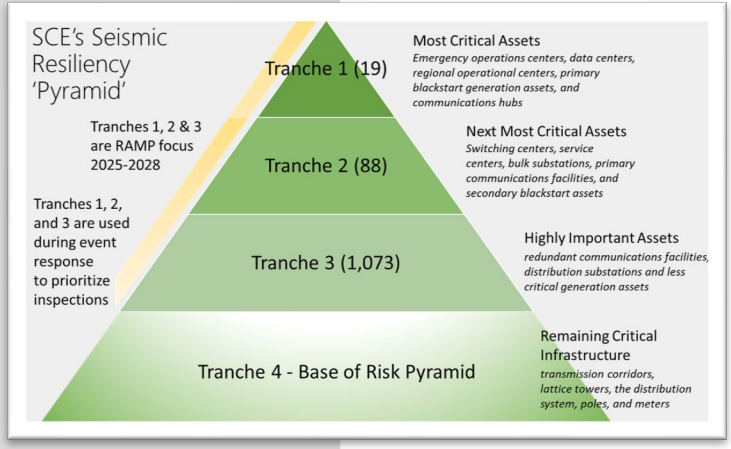
2) Resiliency Pyramid; tranched approach to prioritization of projects

3) Natural system and infrastructure;

   scaling and non-linearity

   it makes *even more* sense to concentrate on the most critical assets first (further justifies spending more to harden these assets)

SCE's approach combines *safety* & *reliability*



SCE's Seismic Resiliency 'Pyramid;' a *tranched* strategy

What has been accomplished so far?

SCE has invested $252 M (from 2016-2024) in a diverse mixture of completed mitigation projects

- ✓ Substation switchyard work
- ✓ Building retrofits
  - ✓ Occupied buildings
  - ✓ Critical facilities
- ✓ Computer equipment racks

SCE Seismic - Team Photo