

## Final Project Summary — PEER Lifelines Program

<b>Project Title—ID Number</b>	<i>Validation of 1-D Numerical Simulation Procedures—1C02a</i>		
<b>Start/End Dates</b>	05/01/00 08/30/01	<b>Budget/ Funding Source</b>	\$50,000/ PG&E-CEC
<b>Project Leader (boldface) and Other Team Members</b>	<b>Walter Silva (PEA)</b>		

### 1. Project goals and objectives

Compare the stochastic finite rupture simulations to recorded motions for five earthquakes to quantify prediction error.

### 2. Benefits of the results of this project to develop technologies and protocols to mitigate the vulnerability of electric systems and other lifelines to damage directly and indirectly caused by earthquakes. Also, benefits to develop assessment techniques to evaluate damage to electric systems caused by earthquakes and to assess fiscal impacts due to the loss of electric service to the community.

Finite rupture scenarios can be used to supplement actual earthquake recordings to provide guidance in characterizing seismic loads to engineered structures.

### 3. Brief description of the accomplishments of the project

All five earthquakes and specified recording sites were modeled.

### 4. Describe any instances where you are aware that your results have been used in industry

The simulation methodology was used to develop seismic demands for analyses at some twenty sites.

### 5. Methodology employed

The methodology uses a grid of small point sources distributed on a rupture surface sequentially ruptured to simulate a large propagating rupture and includes equivalent-linear site response.

### 6. Other related work conducted within and/or outside PEER

This same effort was performed by two other groups reflecting distinct simulation methodologies.

### 7. Recommendations for the future work: what do you think should be done next?

The validation should be extended to many more earthquakes.

### 8. Author(s), Title, and Date for the final report for this project

Walter Silva, Nick Gregor, Bob Darragh.

Validation of 1-D Numerical Simulation Procedures. 6/12/02.