



**Media Advisory**

**January 6, 2004**

**EERI SENDS ENGINEERING TEAM TO IRAN**

For more information

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**A Statement by EERI President Thomas O'Rourke follows:**

The Earthquake Engineering Research Institute (EERI) is sending a team of engineers and medical specialists to Iran to investigate and report on the effects of the severe earthquake that destroyed the city of Bam on 26 December. That earthquake resulted in the deaths of more than 30,000 people, with an additional 50,000 seriously injured. Over 90 percent of the buildings in Bam collapsed and numerous others are inhabitable, leaving more than 100,000 homeless throughout the earthquake-stricken region. The earthquake destroyed the historical citadel of Arg-e-Bam, adding severe cultural loss to its growing and shocking list of serious effects.

The team consists of structural and geotechnical engineers, a physician, engineering seismologists, and environmental and risk experts. Several team members are already in Bam and the surrounding area working with colleagues of the International Institute of Earthquake Engineering and Seismology (IIEES) in Tehran. This reconnaissance is an international, cooperative effort between EERI and IIEES to collect perishable data, determine the causes of damage and loss of life, observe emergency response operations, apply and test advanced technologies for data

acquisition and restoration management, and recommend measures to reduce the chances of such destruction in the future. The team is led by Farzad Naeim, structural engineer and legal councilor with John A Martin & Associates. The reconnaissance is being coordinated at EERI by Marjorie Greene. The team's primary goal is to learn from this earthquake and help others implement the lessons into improved practices for reducing risk.

EERI is a national, nonprofit technical society of engineers, geoscientists, architects, planners, public officials, and social scientists. The 2,500 members of EERI include researchers, practicing professionals, educators, government officials, and building code regulators. One of the principal objectives of EERI is to reduce earthquake risk by advancing the science and practice of earthquake engineering. As part of its mission, EERI manages a *Learning from Earthquakes* program, supported by the National Science Foundation. Through this program EERI organizes reconnaissance activities for virtually all serious worldwide earthquakes, including the 1989 Loma Prieta and 1994 Northridge earthquakes on US soil and the 1988 Armenia and 1999 Turkey earthquakes in the Mideast. Most recently, EERI published a reconnaissance report about the Bourmerdes earthquake that struck Algeria in May, 2003 and posted preliminary reconnaissance observations for the San Simeon earthquake that struck central California on 22 December. Information about the Bam earthquake may also be found at the EERI web site: <http://www.eeri.org/>.

The Bam and San Simeon earthquakes remind us of the danger associated with seismically active regions, and the accentuation of that danger by the types of buildings subjected to earthquake forces. Both were 6.5 magnitude earthquakes that occurred at approximately the same 5-mile depth. Their results were dramatically different.

In contrast to the Bam earthquake, two people were killed in the California quake, and about 40 buildings were severely damaged. For both earthquakes, the main causes of damage and death are weak and vulnerable buildings. In California, most damage was confined to unreinforced masonry structures that were built of brick and mortar with no special support features or metallic strengthening. These structures were constructed before modern building codes, and are widely recognized as susceptible to earthquake shaking. Engineering reconnaissance in Pasa Robles shows that even moderate strengthening and retrofitting of masonry buildings led to a remarkable difference in their seismic response, with no observations of

collapse in retrofitted structures. Bam illustrates a similar lesson, but on a much larger and devastating scale. The buildings in Bam were typically adobe structures, made of dried mud bricks with little or no reinforcing or seismic detailing. The collocation of many such buildings and a shallow earthquake of significant magnitude led to catastrophe.

Although Bam is situated in a seismically active region, there has been a long absence of serious earthquakes at or near its location. As a result, Bam is a grim example of a low probability, high consequence event. Although earthquakes at Bam are infrequent in historical terms, they are inevitable.

Over 75 million Americans in 39 states are exposed to serious earthquakes. Many of them live in areas of infrequent earthquake occurrence and serious consequences should an earthquake occur. It is important to recognize the vulnerability of certain types of buildings in these areas, such as unreinforced masonry and non-ductile concrete structures, and take steps to strengthen them. The large inventory of vulnerable US buildings, especially those outside California, places many of our communities at risk from high impact, low recurrence events. The lessons of Bam are not confined to Iran. They are relevant for the US.

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**EERI Bam Post Earthquake Investigation Team: Team Departs for Iran on Friday January 9<sup>th</sup> and returns January 18<sup>th</sup>.**

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