

**MEMORANDUM OF UNDERSTANDING**

**FOR ESTABLISHMENT OF THE**

**ASIAN-PACIFIC NETWORK OF CENTERS FOR**

**EARTHQUAKE ENGINEERING RESEARCH (ANCER)**

**I. General**

Damaging earthquakes occur frequently throughout the world. The 1976 Tangshan earthquake in China, the 1994 Northridge earthquake in the US, and the 1995 Kobe earthquake in Japan have all illustrated the damaging effects of seismic events on densely populated urban regions. This is of particular concern because many such cities, whether located in areas of low, moderate or high seismicity, are not only some of the most congested in the world, but are also major financial and industrial centers, and any interruptions to critical facilities and business operations would certainly result in serious long-term social and economic consequences of regional and global scale. This Memorandum of Understanding (MOU) recognizes that the vulnerability of densely populated urban regions is an international concern, not just in terms of human safety but also considering the impact on regional, national, and international economies.

**II. Objective and Guiding Principles**

The objective of this MOU is to establish an Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER) that can better leverage and coordinate limited resources in the respective countries to develop and implement, on a cooperative basis, innovative engineering methods and new enabling technologies that are needed to design, construct, maintain, manage and renew the built environment for reduced seismic hazard. The founding members of ANCER are : “Korea Earthquake Engineering Research Center”, “Institute of Engineering Mechanics of China Seismological Bureau”, “Multidisciplinary Center for Earthquake Engineering Research of USA”, “Mid-America Earthquake Center of USA” , “Pacific Earthquake Engineering Research Center of USA” , “Disaster Prevention Research Institute, Kyoto University of Japan”, and “Center for Research on Earthquake Engineering, Chinese Taipei”.

The major purpose of establishing ANCER is to develop synergies that facilitate joint research projects that are of scope and magnitude such that they cannot be easily carried out by the individual centers. Additionally, focus will be placed on the integration of research and education with two goals in mind: (i) to better educate the next generation of earthquake engineers, and (ii) to provide continued professional development to practicing engineers.

With many of the largest cities in the Asian-Pacific region vulnerable to multiple natural hazards, the trend toward larger disasters and increased human and financial losses is certain to continue. To develop more consistent and effective hazard mitigation strategies, multiple hazard solution approaches should be pursued in the coming years.

It is also recognized that though the focus of ANCER is earthquake hazard reduction, the broad base of ANCER is future challenges in the safety and performance of civil infrastructure systems (CIS), which correlate closely with the nation’ s or region’ s growth of economy and employment as well as people’ s life quality. During an era of rapid industrial development, CIS is depended on by every nation or society as a firm corner stone of such transformations. It is anticipated therefore that the ANCER’ s scope of activities will be appropriately expanded above and beyond the border line of seismic safety in the future.

**III. Operating Principles**

1. Funding for selected projects will be within the existing earthquake engineering centers. However, a central focus of ANCER should be to establish new funding mechanisms, such as APEC organizations, for their joint research activities and further expand the scope of the activities of the respective centers.
2. A Management Board shall be established consisting initially of directors of the seven (7) founding centers. All major program decisions and oversight shall be the responsibility of this board. The chairperson of the board, who will serve a 3-year term, shall be selected among and by the board members. Operating rules and changes in membership shall be by unanimous vote of the board. Meetings of the Management Board will be held at least once per year. The primary objectives of these meetings will be to: (i) evaluate the progress during the previous period, (ii) chart the course of the subsequent year, and (iii) develop new long-term joint program initiatives.
3. An advisory committee shall be established aimed at gathering timely input and advice on the projects. The committee will be composed of internationally renowned experts in earthquake engineering, as well as earthquake engineering professionals in the government, industry and private sector.

## VI. Scope of Cooperative Activities

The types of activities should include but not be limited to the following categories for promotions of common interest:

- Exchange of research plans
- Exchange of data and information
- Networking of experimental facilities
- Exchange of research personnel, including students
- Cooperative workshops and seminars for assessment of the state-of-the-art of a special subject of mutual interest or for development of research plan for a subject area of potential importance to the fulfillment of ANCER objectives
- Cooperative research projects

The scope of this research should focus in three areas: (i) technological driven opportunities, (ii) societal driven opportunities, and (iii) innovative methodologies.

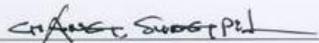
The research shall be envisioned to have three distinct components. The first component is *fundamental research* that encompasses basic scientific and engineering research that pioneers new knowledge for future earthquake engineering applications. The second component is *new technology* that enables added capability for increasing seismic safety and improved infrastructure performance in an effective and economical manner. Note that new technology is often developed in a multi-disciplinary environment of science and engineering research. The third component is *earthquake engineering application* of fundamental research and new technology. Demonstration projects and full-scale implementation of research discoveries are essential for testing new concepts and transferring knowledge to industry, the private sector, governments, and other stakeholders in seismic safety.

Cooperative research projects that involve substantive collaboration between investigators and investigating project teams are particularly emphasized. Cooperative projects can be bi-lateral, tri-lateral or multi-lateral in nature. Projects may also involve additional organization and/or research units beyond these of the member centers.

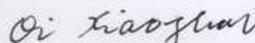
This MOU shall become effective on the date of the signature by all parties and remain in force for five years past the date of the signing of this agreement. This MOU may be renewed periodically under the condition of continuing mutual interest and benefit.

Signed by

Date

  
\_\_\_\_\_  
Professor Sung-Pil Chang  
Korea Earthquake Engineering Research Center

March 26, 2001

  
\_\_\_\_\_  
Professor Xiao-Zhai Qi  
Institute of Engineering Mechanics of China Seismological Bureau

March 16, 2001

  
\_\_\_\_\_  
Professor George C. Lee  
Multidisciplinary Center for Earthquake Engineering Research of USA

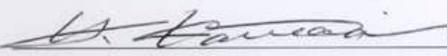
April 9 2001

  
\_\_\_\_\_  
Professor Daniel P. Abrams  
Mid-America Earthquake Center of USA

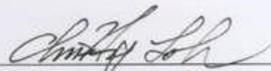
April 16, 2001

  
\_\_\_\_\_  
Professor Jack P. Moehle  
Pacific Earthquake Engineering Research Center of USA

1 May 2001

  
\_\_\_\_\_  
Professor H. Kameda  
Disaster Prevention Research Institute, Kyoto University of Japan

April 3, 2001

  
\_\_\_\_\_  
Professor Chin-Hsiung Loh  
Center for Research on Earthquake Engineering, Chinese Taipei

April 5, 2001

## Proposed

### Action Plan for Establishment of ANCER

#### Time Frame

- **To establish a Task Force Committee (TFC)** February 2001  
to initiate planning of ANCER including development of a draft management structure and a draft strategic plan  
  
3 committee members plus an advisor  
Chang (Korea), Lee (USA), Qi (China), Liu (Advisor)
  
- **The Management Board will:**
  - Develop a strategic plan for continuing ANCER program development April 2001
  - develop an ANCER management plan June 2001  
(including organization and funding requirements sources and mechanisms)
  - establish an advisory committee for ANCER July 2001
  - develop ANCER program activities, which include:
    - detailed short-term program implement plan August 2001
    - rationale and proposals to seek funding to carry out program activities for the initial 2-3years September 2001
    - organization of the 1st ANCER Workshop October 2001
  
- **Start-up and preparation for full-scale ANCER operation in March 2002** November 2001  
(including a full-member ANCER meeting) – February 2002